Nortec
www.humidity.com

MH Series™

EVAPORATIVE HUMIDIFIER/COOLER

Installation Manual

2544832-A

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For each revision, put the revised pages in your manual and discard the superseded pages. Write the revision number and revision date, date put in manual, and the incorporator's initials in the applicable columns on the Record of Revisions.

Revision Number	Revision Date	Date Put In Manual	By	Revision Number	Revision Date	Date Put In Manual	By

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WARRANTY

10-00
INTRODUCTION

1. INTRODUCTION

1.1 GENERAL

Thank you for purchasing the **Nortec MH Adiabatic Air Humidifier**.

The Nortec MH Adiabatic Air Humidifier incorporates the latest technical advances and is designed to meet all recognized safety standards. Nevertheless, improper use of the Nortec MH Adiabatic Air Humidifier may result in danger to the user or third parties and/or damage of material assets.

To ensure safe, proper, and economical operation of the Nortec MH Adiabatic Air Humidifier, please observe and comply with all information and safety information contained in this installation and operating manual as well as in any separate documentation related to the components installed in the humidification system.

If you have questions, which are not or insufficiently answered in this documentation, please contact your Nortec representative. They will be glad to assist you.

1.2 NOTES ON THE INSTALLATION & OPERATING INSTRUCTIONS

Limitation

The product covered in this installation and operating instruction manual is solely the Nortec MH Adiabatic Air Humidifier. The various accessories associated with the Nortec MH Adiabatic Air Humidifier are only described in such detail that is necessary for proper operation of the humidifier. Further information on accessories can be obtained in the respective instructions.

These installation and operating instructions are restricted to the installation, commissioning, operation, servicing, and troubleshooting of the Nortec MH Adiabatic Air Humidifier and are meant for qualified personnel that are sufficiently qualified for their respective work.

The installation and operating instructions are supplemented by various separate items of documentation (manuals for accessories, etc.). Appropriate cross-references are made to these publications in the installation and operating instructions.

Symbols used in this manual

	The catchword “CAUTION” designates notes in this installation and operating instructions that, if neglected, may cause **damage and/or malfunction of the unit or other material assets**.
	The catchword “WARNING” used in conjunction with the general caution symbol designates safety and danger notes in this installation and operating instructions that, if neglected, may cause **injury to persons**.
	The catchword “DANGER” used in conjunction with the general caution symbol designates safety and danger notes in this installation and operating instructions that, if neglected, may lead to **severe injury or even death of persons**.

Safekeeping

Please safeguard these installation and operating instructions in a safe place, where they can be immediately accessed. If the equipment changes hands, the documentation must be passed on to the new operator.

If the documentation gets misplaced, please contact your Nortec representative.

Copyright protection

The present installation and operating instructions is protected under the Copyright Act. Passing-on and reproduction of the manual (or part thereof) as well as exploitation and communication of the contents are prohibited without written permission by the manufacturer. Violation of copyright terms is subject to legal prosecution and arises liability for indemnification.

The manufacturer reserves the right to fully exploit commercial patent rights.

2. FOR YOUR SAFETY

2.1 SAFETY OVERVIEW

General

Every person working with the Nortec MH must have read and understood the installation and operating instructions before carrying out any work. Knowing and understanding the contents of the installation and operating instructions is a basic requirement for protecting all personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All signs and markings applied to the unit must be observed and kept in a readable state.

Qualification of personnel

All work (installation, operating, servicing, etc.) described in these installation and operating instructions **may only be carried out by a specialist who is well trained and adequately qualified and is authorized by the customer**.

For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorized by the manufacturer.
It is assumed that all persons working with the Nortec MH are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

Intended use

The Nortec MH Adiabatic Air Humidifier/cooler is intended exclusively for **air humidification/air cooling in air ducts or air handler** within the specified operating conditions. Any other type of application, without the written consent of your Nortec Representative, is considered as not conforming with the intended purpose and may lead to the Nortec MH becoming dangerous.

Operation of the equipment in the intended manner requires **that all the information in these instructions are observed (in particular the safety instructions)**.

Danger that may arise from the unit

Danger: Some components of the Nortec MH are mains powered.

	One may get in touch with live parts when the control unit or the distribution boxes are open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work set the Nortec MH out of operation (switch off the unit, disconnect it from the mains and stop the water supply) and secure the unit against inadvertent power-up.

Warning: The UV lamp used in the water treatment unit (option) emits harmful UV-C rays.

	If the UV lamp is operated outside the housing, the emitted UV-C rays may damage the eyes.

Prevention: Never operate the UV lamp outside the housing.

Warning: Badly maintained humidifiers can endanger the health.

	If the unit is not properly maintained germs may grow in the water tub which can cause illness and the humidification boxes (and the mist eliminator) of the Nortec MH and may affect the air passing through the humidifier.

Prevention: The Nortec MH must be cleaned in the prescribed intervals according to the information given. The cleaning works must be carried out correctly and the humidification boxes and the mist eliminator boxes must be replaced after their prescribed lifetime has elapsed.

In case of danger

If safe operation is no longer possible, then the Nortec MH should immediately be shut down and secured against accidental power-up.

This can be the case under the following circumstances:

- if the Nortec MH is damaged
- if the Nortec MH is no longer operating correctly
- if connections and/or piping are not sealed
- if electrical cables are defective

All persons working with the Nortec MH must report any alterations to the unit that may affect safety to the owner without delay.

Prohibited modifications to the unit

No modifications must be undertaken on the Nortec MH without the express written consent of the manufacturer.

For the replacement of defective components use exclusively original accessories and spare parts available from your Nortec supplier.

3. PRODUCT OVERVIEW

3.1 MODEL OVERVIEW

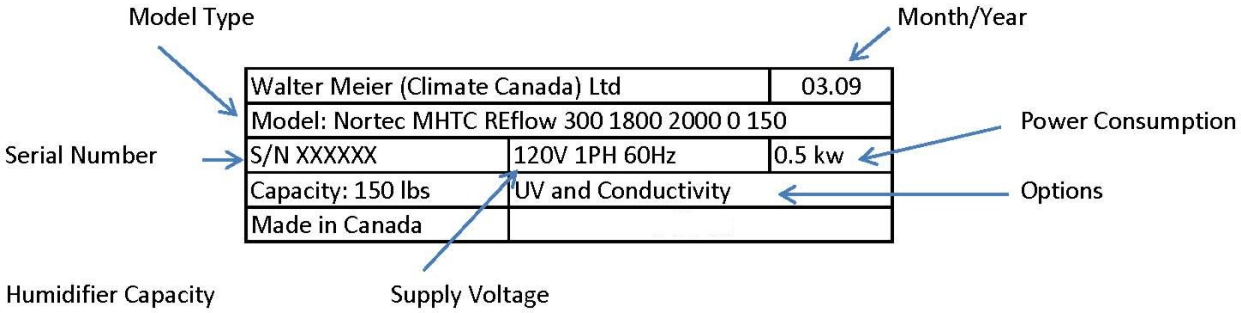
The Nortec MH is available in the two base versions “flow” with direct water system and “Reflow” with circulating water system. The following base models are available:

- **Nortec MHB Flow (On/Off Control)**
- **Nortec MHTC Flow (Total Control Staging)**
- **Nortec MHB Reflow (On/Off Control)**
- **Nortec MHTC Reflow (Total Control Staging)**

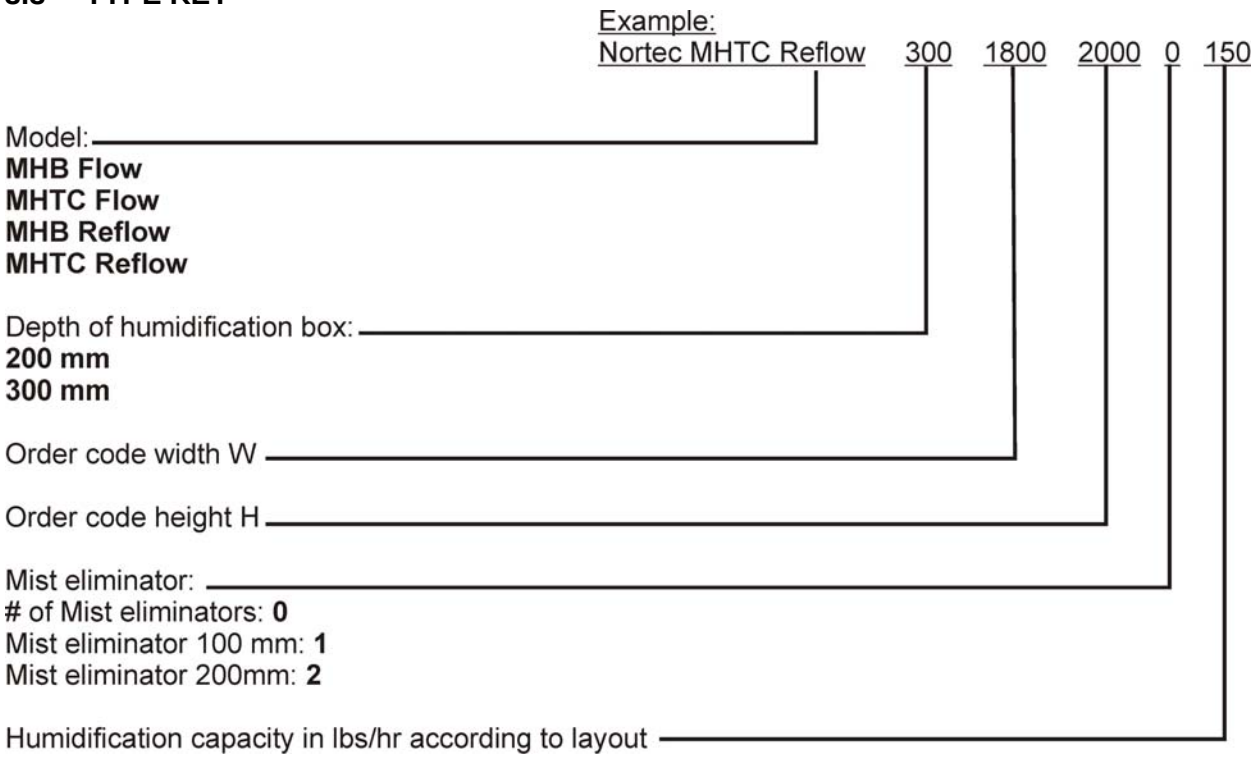
All base models can be extended in their functions by different options. In addition there are different accessories available for all models.

3.2 PRODUCT DESIGNATION

The product designation and the most important unit data are found on the rating plate:

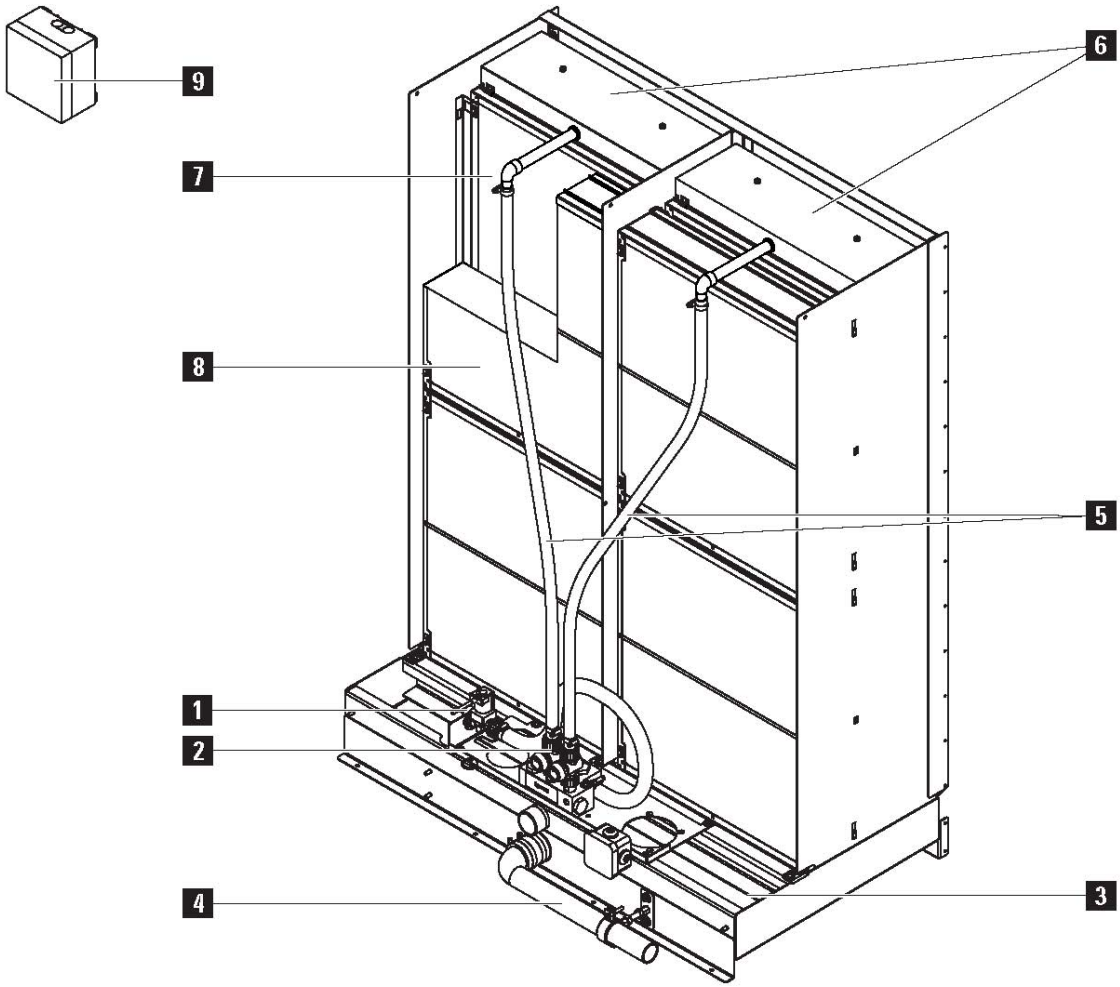


3.3 TYPE KEY



3.4 MHB Flow Model

3.4.1. MHB Flow Construction Model



1 Water connection on unit R 3/4 " (outside thread)
2 Volume controlling valves (adjustable manually)
3 Water tub
4 Open drain 1.5” PVC (1.66” (42 mm) OD)
5 Water hoses
6 Spray bar cap with distribution pipes
7 Humidification boxes
8 Mist eliminator (for air speed above humidification boxes >3.8 m/s) (750 fpm)
9 Control unit on/off

Figure 1. Construction Model – MHB Flow

3.4.2. MHB Flow System Overview

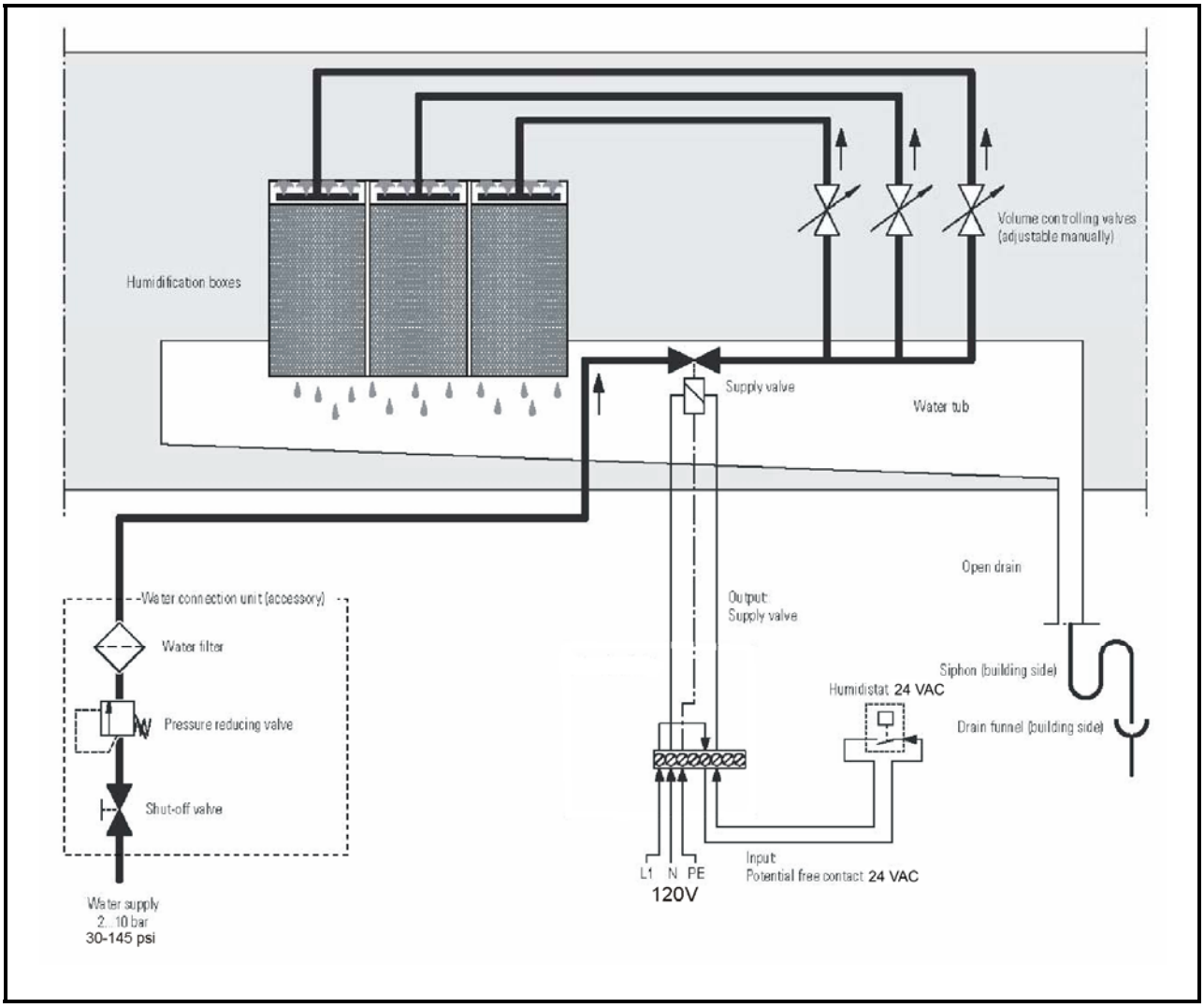


Figure 2. System Overview – MHB Flow

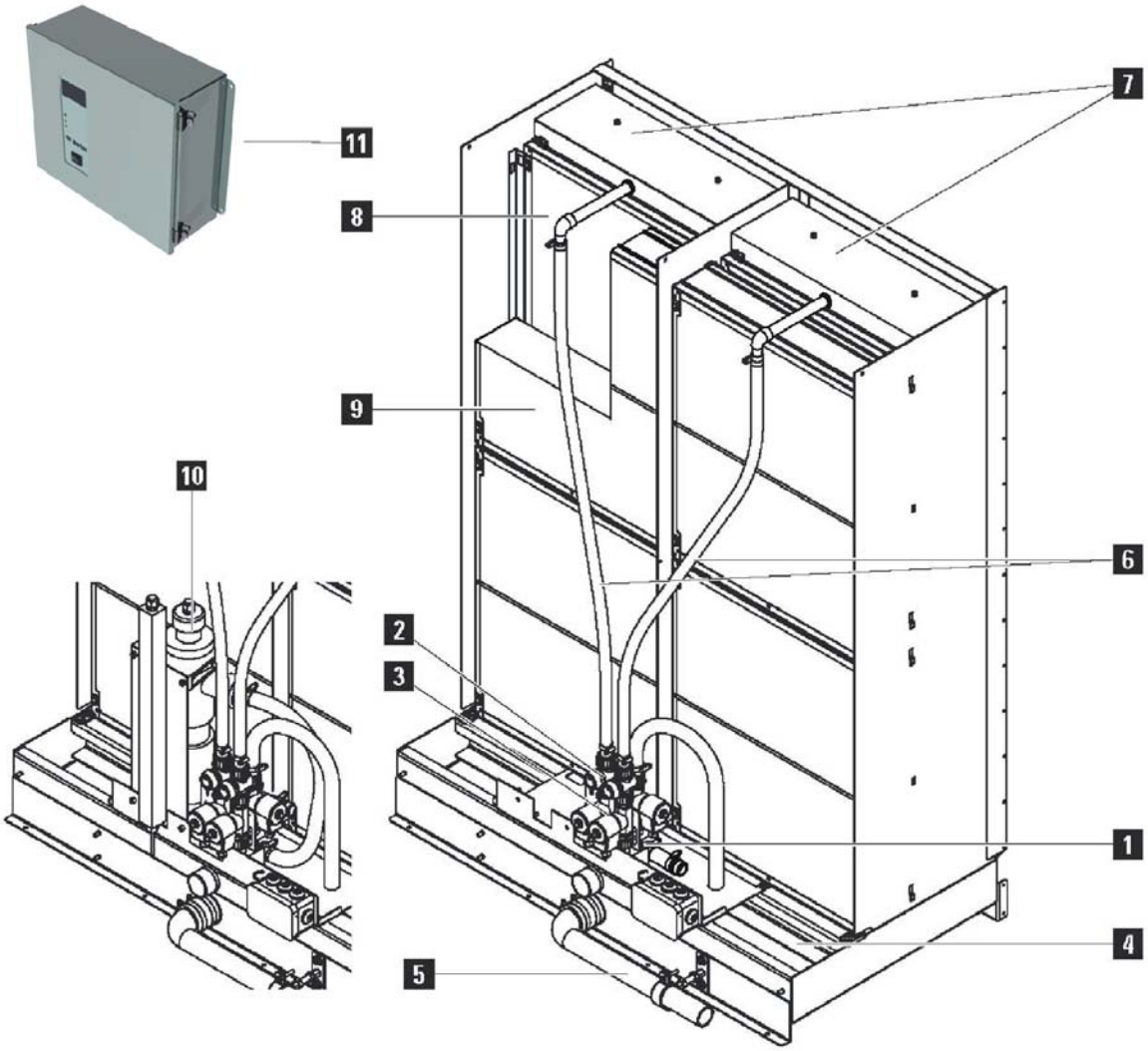
Functional description

The MHB Flow model provides On/Off control by means of the MHB control unit and an external On/Off humidistat. In case of a humidification/cooling request the supply valve opens and the water flows via the pressure reducing valve (accessory), the water filter (accessory) and the manually adjustable volume controlling valves to the distribution pipes above the humidification boxes.

The distribution pipes evenly supply the water to the entire surface of the humidification boxes where it flows down and humidifies the air flowing through the humidification boxes. The excess water not used for humidification flows to the water tub and then directly to the drain.

3.5 MHTC Flow Model

3.5.1. MHTC Flow Construction Model



1 Water connection on unit R 3/4 " (outside thread)
2 Volume controlling valves (adjustable manually)
3 Step valves (1 to 3)
4 Water tub
5 Open drain (outside diameter 1.5" PVC (1.66" (42 mm) OD)
6 Water hoses
7 Spray bar cap with distribution pipes
8 Humidification boxes
9 Mist eliminator (for air speed above humidification boxes >750 fpm) (3.8 m/s)
10 UV water treatment (option)
11 MHTC Total Control Unit

Figure 3. Construction Model – MHTC Flow

3.5.2. MHTC Flow System Overview

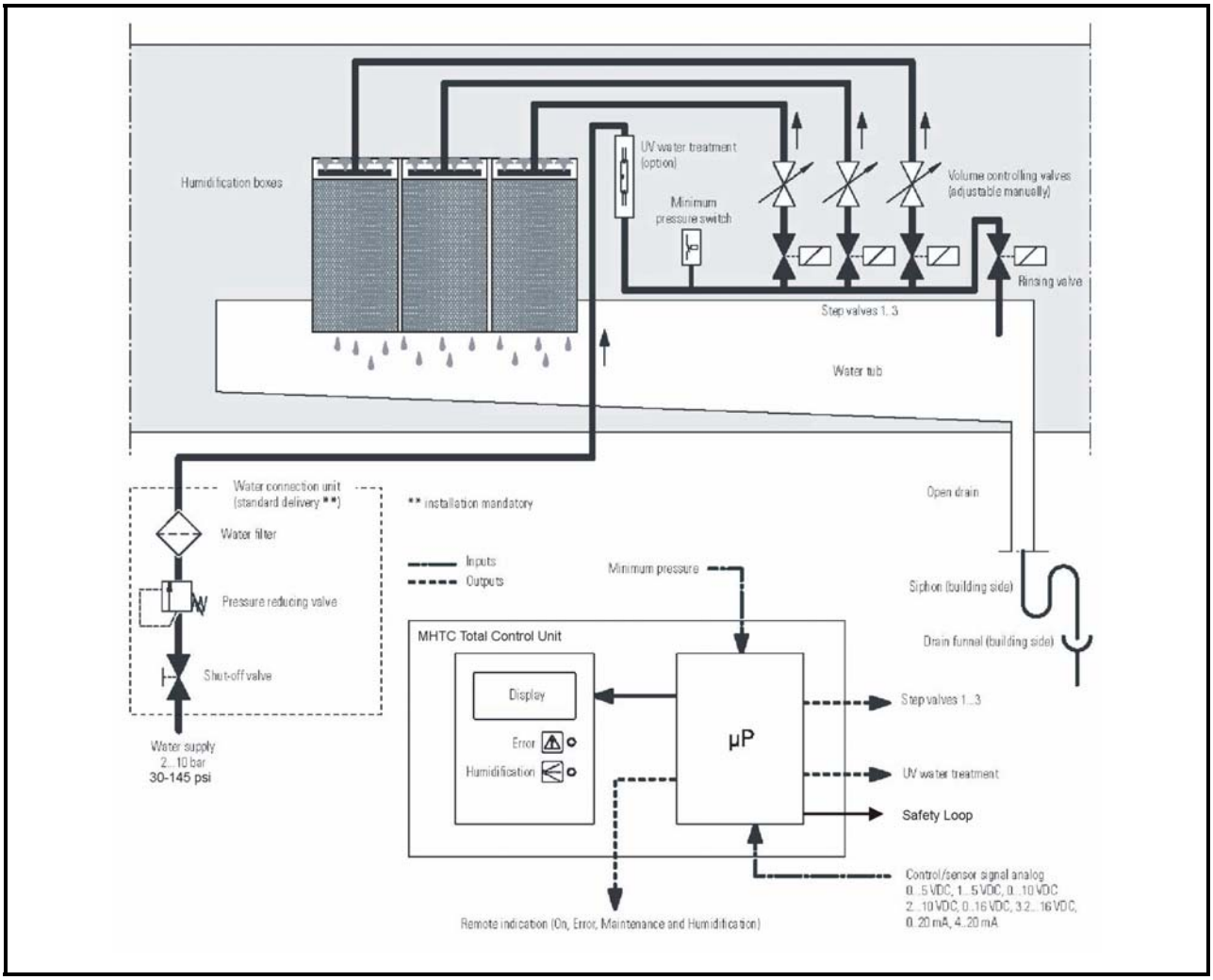


Figure 4. System Overview – MHTC Flow

Functional description

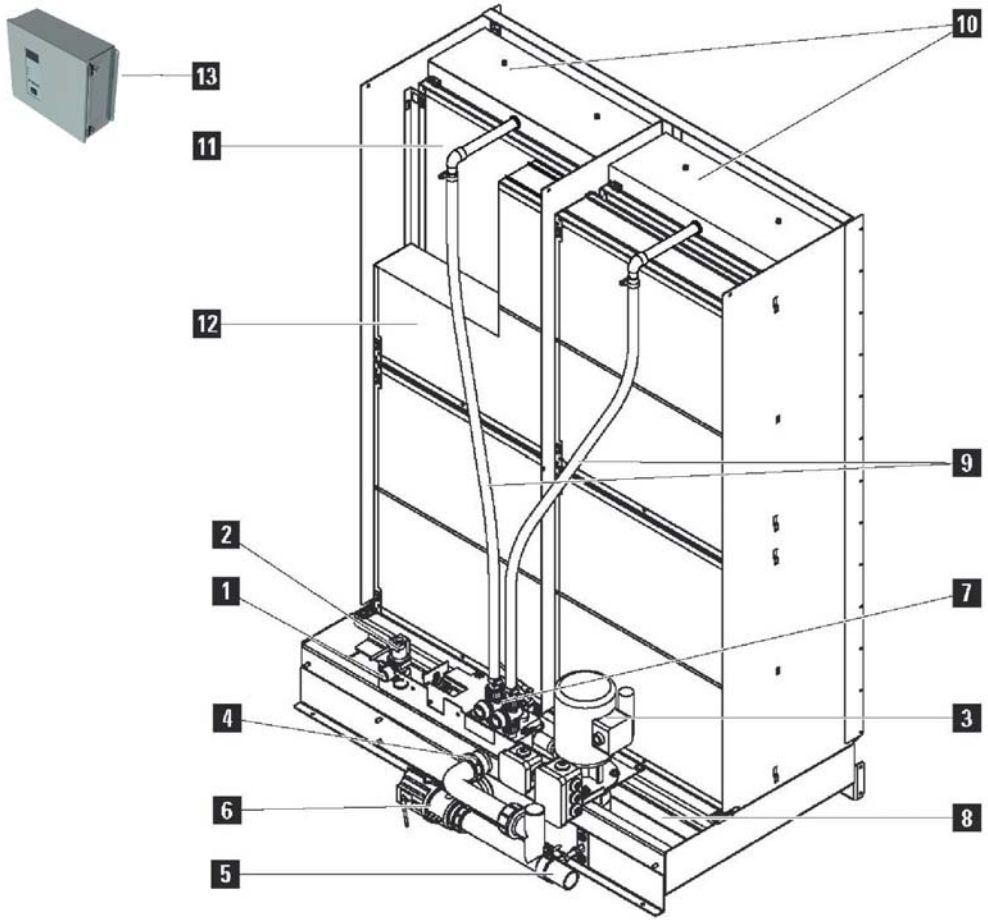
The MHTC Flow model provides multistep control by means of the MHTC Total Control unit and the step valves (1, 2 or 3 step valves depending on the humidifier capacity). The MHTC Total Control unit (for wall mounting) processes analog sensor/control signals and uses them to control the step valves. This allows multistep control (1 to 3 steps depending on the humidifier capacity) which improves control accuracy compared to the MHB Flow model.

In case of a humidification/cooling request one, two or all three step valves open (depending on the request). The water flows via the manually adjustable volume controlling valves to the distribution pipes above the humidification boxes.

The distribution pipes evenly supply the water to the entire surface of the humidification boxes where it flows down and humidifies the air flowing through the humidification boxes. The excess water not used for humidification flows to the water tub and then directly to the drain. If the MHTC Flow model is equipped with the optional UV water treatment (installed in the water supply) the water is continuously sterilized during the humidification process.

3.6 MHB Reflow Model

3.6.1. MHB Reflow Construction Model



1 Water connection on unit R 3/4 " (outside thread)
2 Level-controlled supply valve
3 Circulation pump
4 Overflow
5 Drain
6 Drain valve
7 Volume controlling valves (adjustable manually)
8 Water tub
9 Water hoses
10 Spray bar caps with distribution pipes
11 Humidification boxes
12 Mist eliminator (for air speed above humidification boxes >750 fpm) (3.8 m/s)
13 MHB Control Unit

Figure 5. Construction Model – MHB Reflow

3.6.2. MHB Reflow System Overview

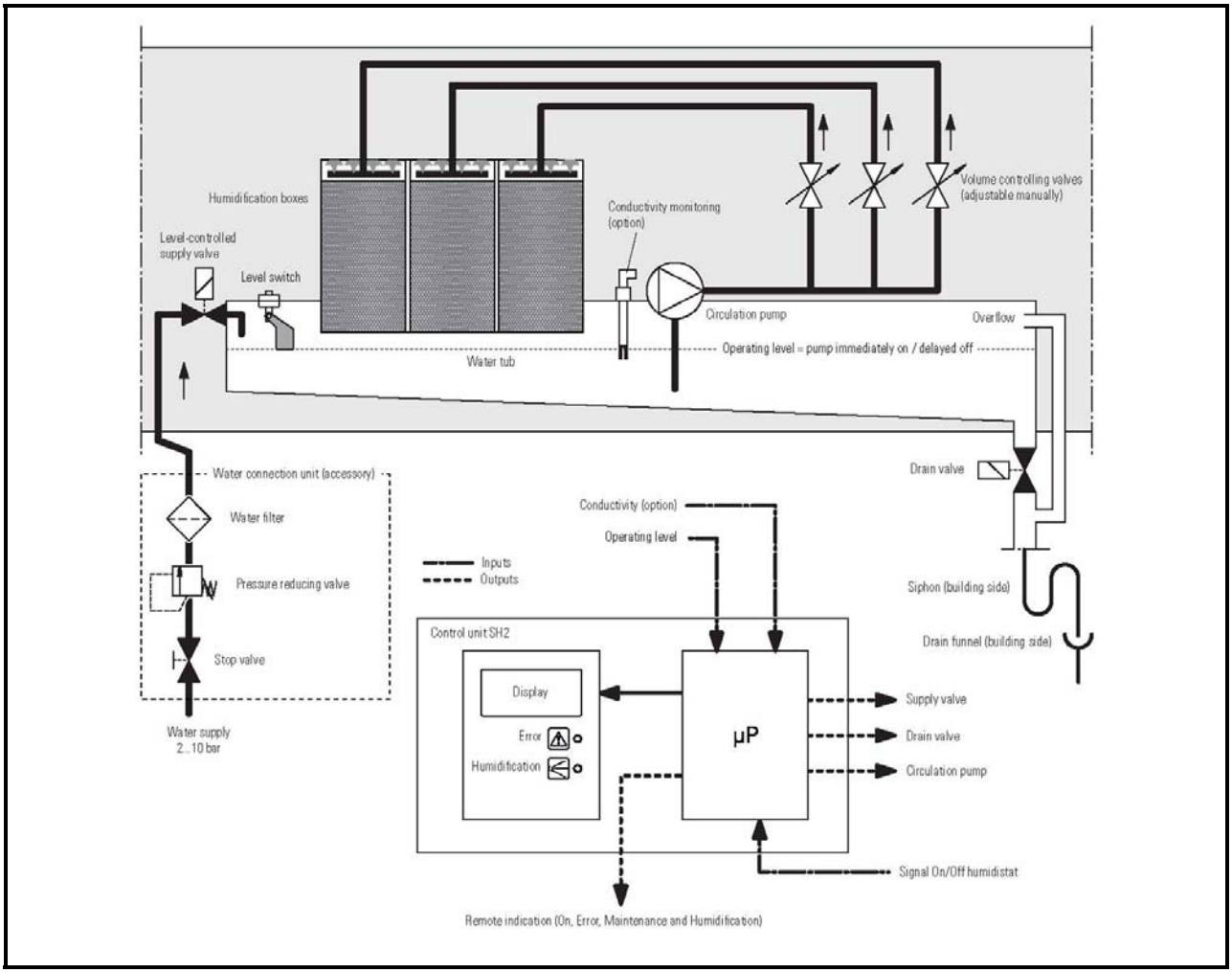


Figure 6. System Overview – MHB Reflow

Functional description

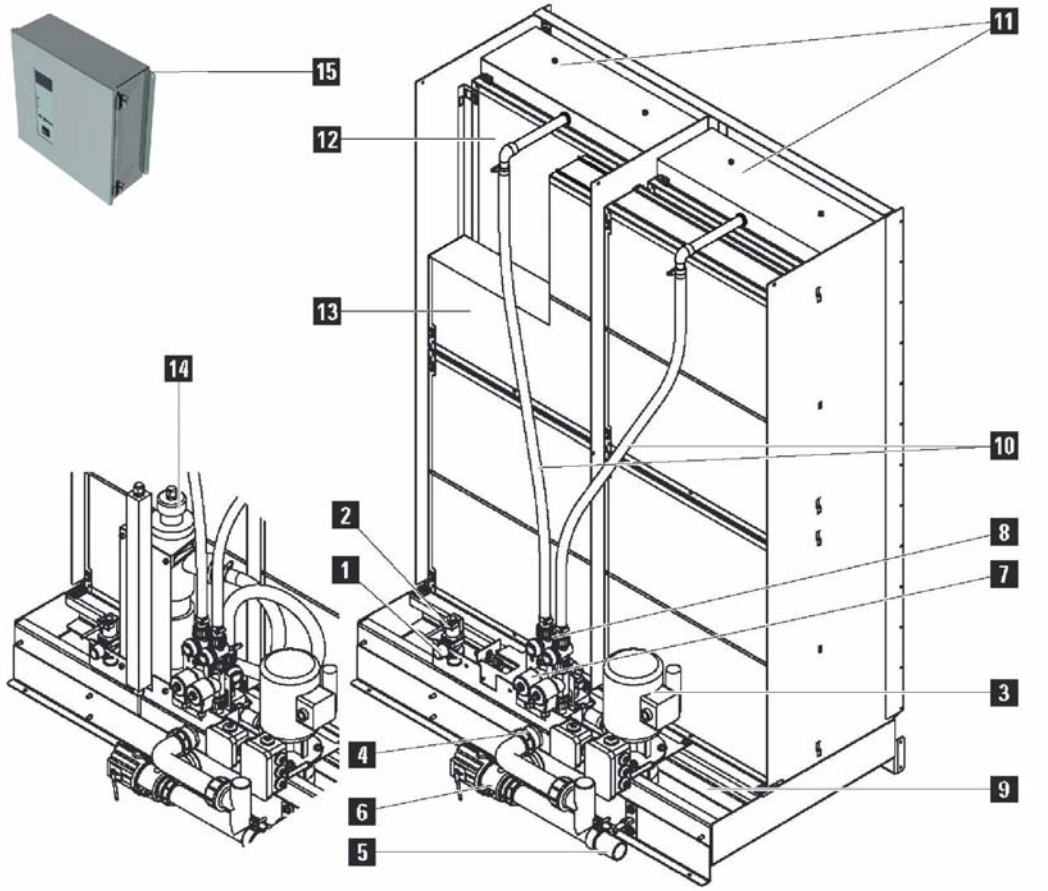
The water tub is filled up to a preset upper level via the level-controlled supply valve. When the water level in the tub drops below a certain limit, the level-controlled supply valve opens until the upper limit is reached again. The pump is activated whenever the float is high and continues to operate for a preset time after the float level drops.

The **MHB Reflow** model provides On/Off control by means of the MHB control unit and an external On/Off humidistat. In case of a humidification/cooling request the pump is activated. The water flows via the manually adjustable volume controlling valves to the distribution pipes above the humidification boxes.

The distribution pipes evenly supply the water to the entire surface of the humidification boxes where it flows down and humidifies the air flowing through the humidification boxes. The excess water not used for humidification flows to the water tub. To prevent accumulation of mineral residues and the formation of germs in the water tub, the tub is completely drained periodically (interval or time controlled).

3.7 MHTC Reflow Model

3.7.1. MHTC Reflow Construction Model



1 Water connection on unit R 3/4 " (outside thread)
2 Level-controlled supply valve
3 Circulation pump
4 Overflow
5 Drain
6 Drain valve
7 Step valves (1 to 3)
8 Volume controlling valves (adjustable manually)
9 Water tub
10 Water hoses
11 Spray bar cap with distribution pipes
12 Humidification boxes
13 Mist eliminator (for air speed above humidification boxes >750 fpm) (3.8 m/s)
14 UV water treatment (option)
15 MHTC Total Control Unit

Figure 7. Construction Model – MHTC Reflow

3.7.2. MHTC Reflow System Overview

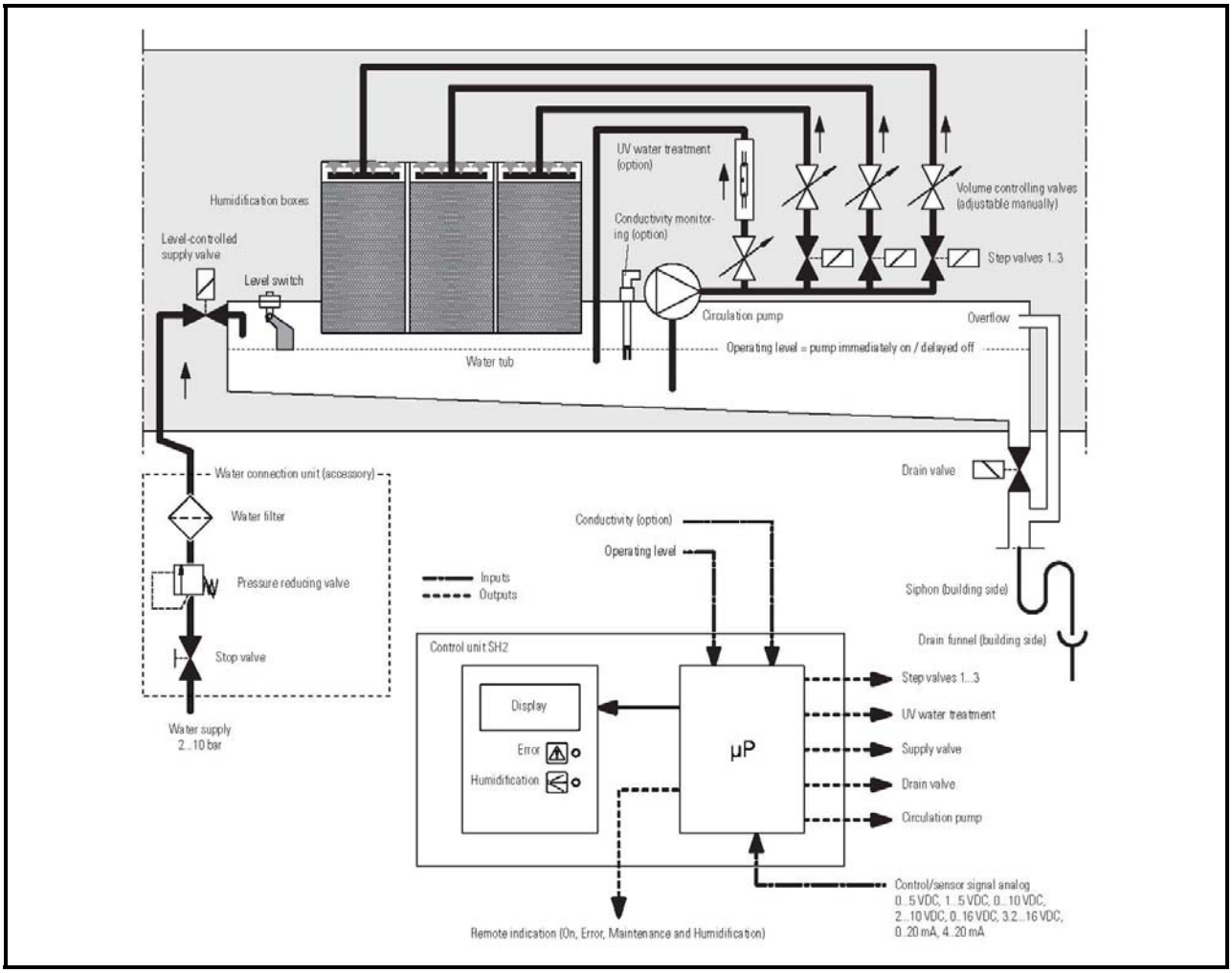


Figure 8. System Overview – MHTC Reflow

Functional description

The water tub is filled up to a preset upper level via the level-controlled supply valve. When the water level in the tub drops below a certain limit, the level-controlled supply valve opens until the upper limit is reached again.

The MHTC Reflow model provides multistep control by means of the MHTC Total Control unit and the step valves (1, 2 or 3 step valves depending on the humidifier capacity). The MHTC Total Control unit (for wall mounting) processes analog sensor/control signals and uses them to control the step valves. This allows multistep control (1 to 3 steps depending on the humidifier capacity) which improves control accuracy compared to the MHB Reflow model.

In case of a humidification/cooling request, the circulation pump starts and one, two, or all three step valves open (depending on the request). The water flows via the manually adjustable volume controlling valves to the distribution pipes above the humidification boxes.

The distribution pipes evenly supply the water to the entire surface of the humidification boxes where it flows down and humidifies the air flowing through the humidification boxes. The excess water not used for humidification flows to the water tub.

To prevent accumulation of mineral residues and the formation of germs in the water tub, the tub is completely drained periodically (Interval or time controlled). Additionally further hygiene functions can be activated: Operation-dependent draining of the water tub (conductivity or fill cycle controlled) as well as cleaning and drying of the humidification boxes.

If the MHTC Reflow model is equipped with the optional UV water treatment, a particular amount of water is led to the UV water treatment unit where it is sterilized.

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3.8 STANDARD DELIVERY

Standard delivery includes:

- Nortec MH Adiabatic Air Humidifier according to type designation (disassembled) equipped with options according to packing list.
- Ordered accessories with operating instructions, packed separately.
- Installation and operating instructions (this document).
- Operating instructions control unit MHTC (models with control unit MHTC only)
- Spare parts list.

3.9 STORING / TRANSPORT / PACKAGING

Storing
Store the unit and unit components in a protected area meeting the following requirements:

- room temperature: 1 ... 40°C (34-104ºF)
- room humidity: 10 ... 75 %rh

Transport
For optimum protection always transport the unit and the unit components in the original packaging.

The weight of the unit components depends on the unit model. To move larger unit components always ask a second person for assistance.

Packaging
Keep the original packaging of the Nortec MH for later use. In case you wish to dispose of the packaging, observe the local regulations on waste disposal. Never dispose of the packaging to the environment.

10-10
INSTALLATION

1. INSTALLATION

1.1 IMPORTANT NOTES ON THE MOUNTING AND INSTALLATION WORK

Qualification of personnel

All mounting and installation work must be carried out only by well qualified personnel authorized by the owner. It is the owner's responsibility to verify proper qualification of the personnel.

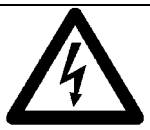
General note

Strictly observe and comply with all information given in the present installation and operating instructions regarding the mounting of the unit and the installation of water and electricity.

Observe and comply with all local regulations dealing with water and electrical installations.

Safety

The electrical installation for the unit models MHB Flow, MHTC Flow, MHB Reflow, MHTC Reflow requires the removal of the control unit cover. Please note the following:

	Danger of electrical shock! You may get in touch with live parts when the control unit is open. The control unit must be connected to the mains only after all mounting and installation work has been completed and the control unit cover has been relocated properly.

	The electronic components inside the control unit are very sensitive to electrostatic discharge. When the unit is open for installation work, appropriate measures must be taken to protect these components against damage caused by electrostatic discharge (ESD protection).

1.2 UNIT MOUNTING

1.2.1. Note on the locating the unit

Usually, the design and dimensioning of the ventilation duct/air handler as well as the location of the Nortec MH inside the duct are determined, recorded and specified when planning the entire system. Prior to installation, however, make sure the following criteria have been taken into consideration:

- For operation with fully demineralised water: Fully demineralised water is aggressive! For this reason, all components located close to the humidification unit (duct/ air handler, fastening material, drain pipe, etc.) must be made of corrosion-proof steel or plastic.
- For installation and maintenance of the humidification unit a viewing window and a sufficiently large maintenance door must be available in the duct/ air handler.
- In the area of the humidification unit the ventilation duct/ air handler must be waterproof.
- Important! An air filter must be installed at the air inlet of the humidification unit. The filter must meet the quality standards (MERV 11 (Note WMCI specifies EU7 (f7) which is equivalent to MERV 11) ASHRAE 52.2 or better.
- In case of low ambient temperature the duct must be insulated to prevent the moist air from condensing inside the duct.
- If the system is equipped with a heater, make sure it is at least 20” (0.5 m) away from the humidification unit.
- If silencers are mounted in the air conditioning units make sure to locate the humidification unit at a minimum distance of 10’ (3 m) before or after the silencers.
- In order to avoid drops seeping over the humidification boxes, an even air flow over the full cross section of the humidification unit must be guaranteed. If necessary, rectifiers or perforated plates must be installed on the building side before the humidifier. If the air velocity through the humidification boxes exceeds 750 fpm (3.8 m/s), mist eliminator must be installed.
- The effective height of the siphon in the drain line depends on the duct pressure. Correct dimensioning of the siphon is the customer’s responsibility.

1.2.2. Mounting Process

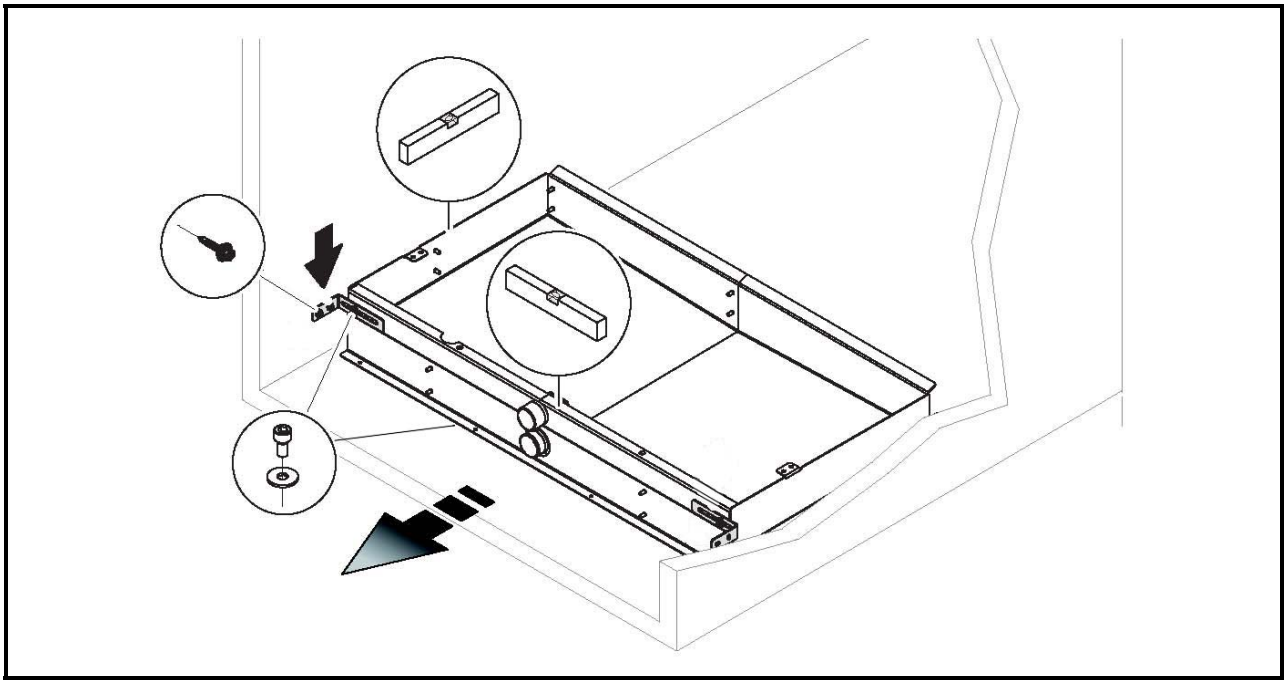


Figure 1. Mounting Process – Step 1

Align the water tub to the centre of the duct, then use a level check water tub to the duct lengthwise and crosswise. Shim the tank as required until it is level.

Note: Install four self-tapping screws 1/4 UNC x 3/4" on each side of the tub to secure it in place.

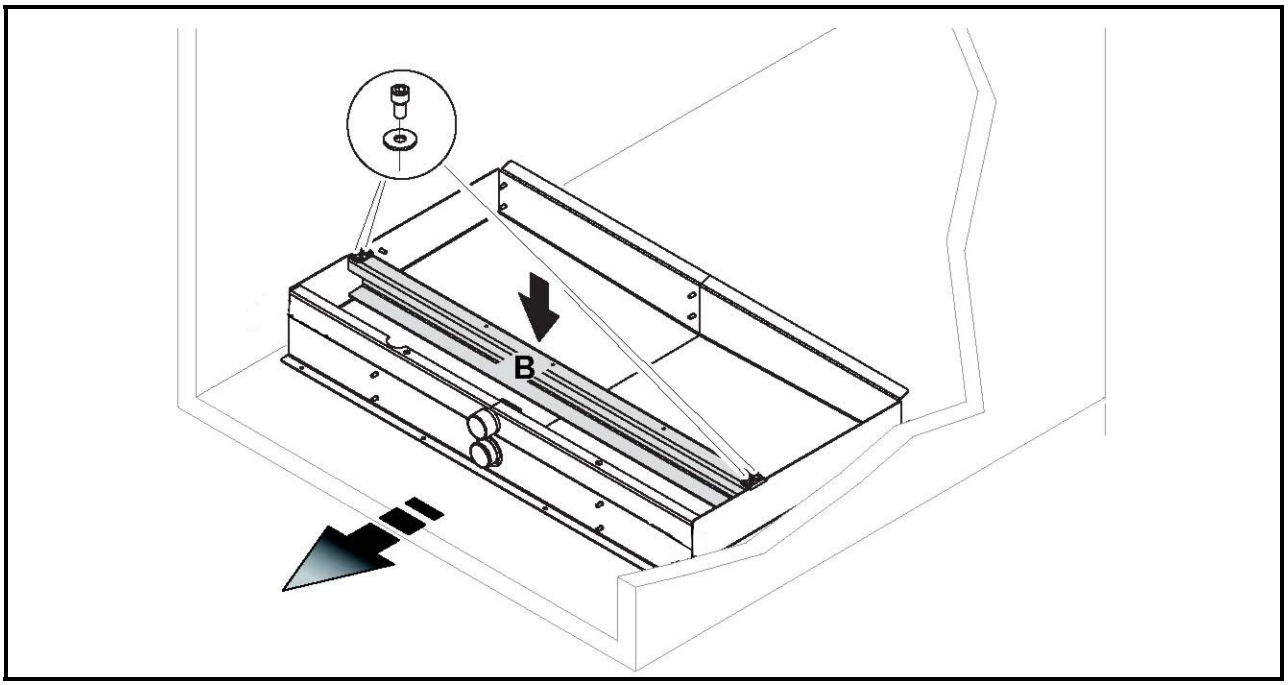


Figure 2. Mounting Process – Step 2

Fix the cross beam "**B**" to the water tub using four hexagon socket screws 1/4 UNC x 1/2" and washers.

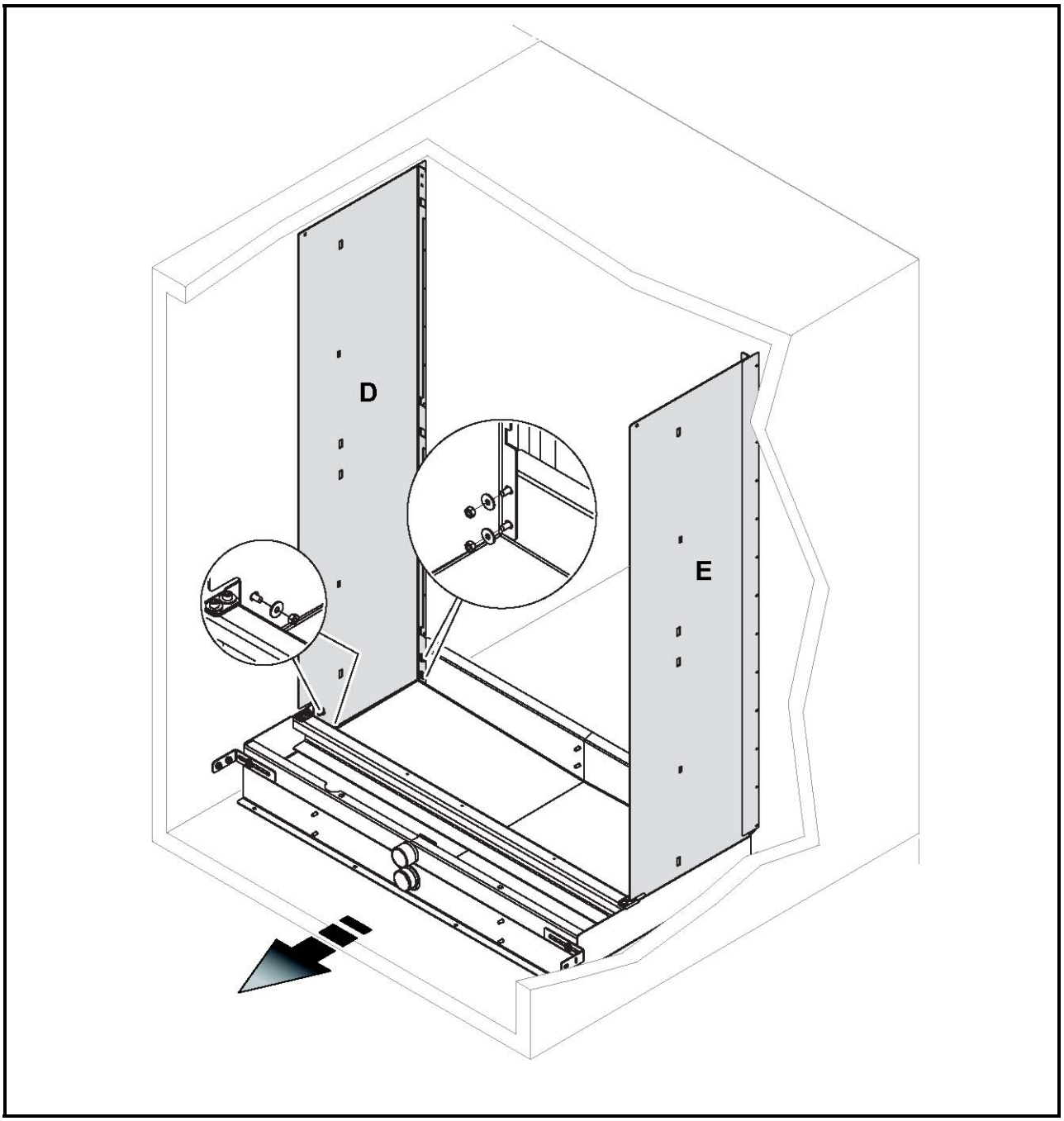


Figure 3. Mounting Process – Step 3

Hint: With close space conditions we recommend to install the EPDM sealing profile to the vertical supports before installing the supports. Please refer to step 7 for more information.

Carefully mount the left "**D**" and the right vertical support "**E**" onto the threaded bolts of the water tank, then fix each support with four 1/4 UNC nuts and washers (do not overtighten the nuts). **Important!** Before tightening the nuts make sure the holes of the vertical supports seat solidly on the sheet metal of the water tub and do not stuck on the collar of the threaded bolt!

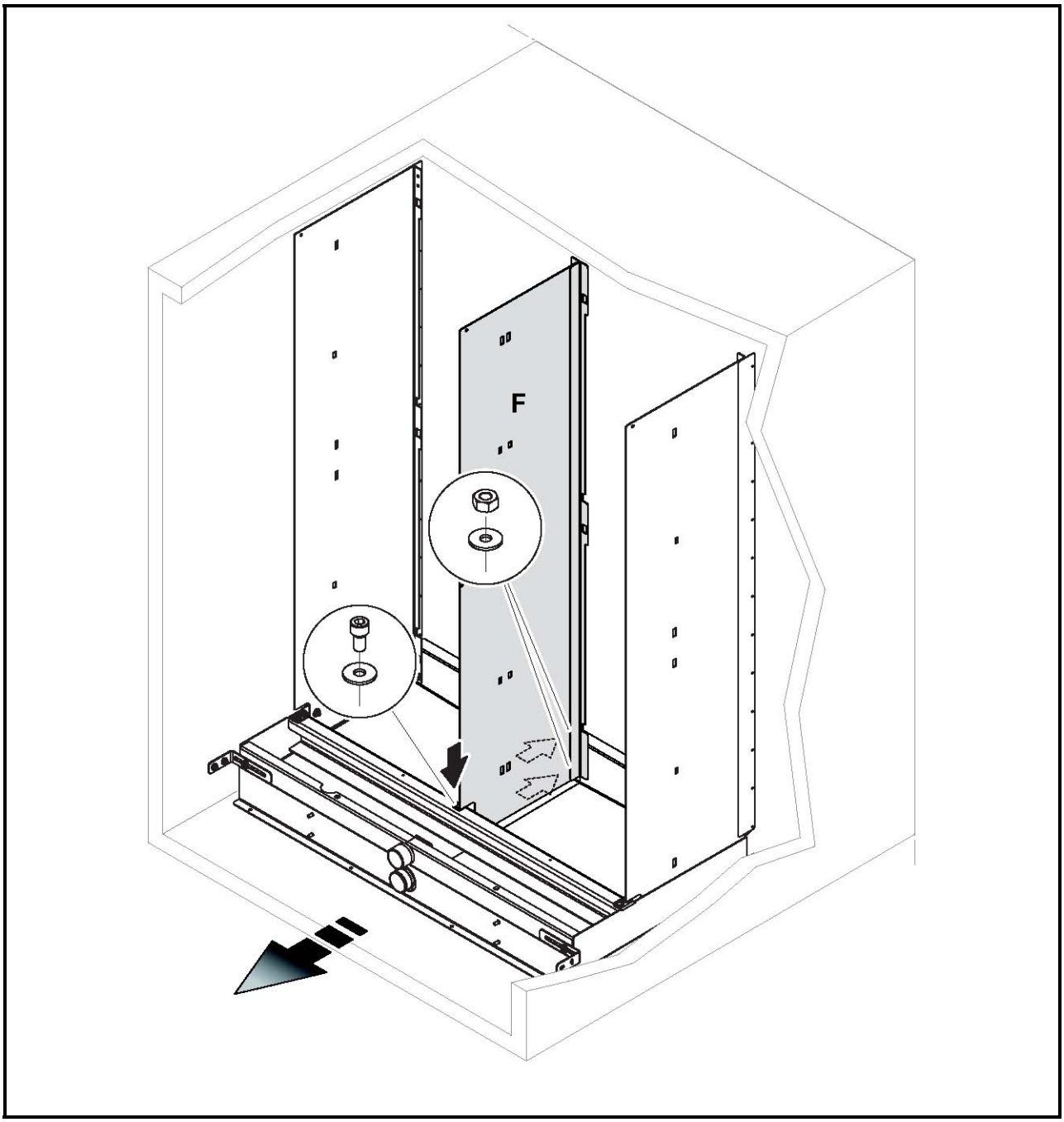


Figure 4. Mounting Process – Step 4

Carefully mount the vertical intermediate support(s) "**F**" (number depending on the unit size) onto the threaded bolts of the water tub, then fix each support with two 1/4 UNC nuts and washers to the water tub (do not overtighten the nuts) and with a hexagon socket screw 1/4 UNC x 1/2" and a washer to the cross beam.

Important! Before tightening the nuts make sure the holes of the intermediate support seat solidly on the sheet metal of the water tub and do not stick on the collar of the threaded bolt!

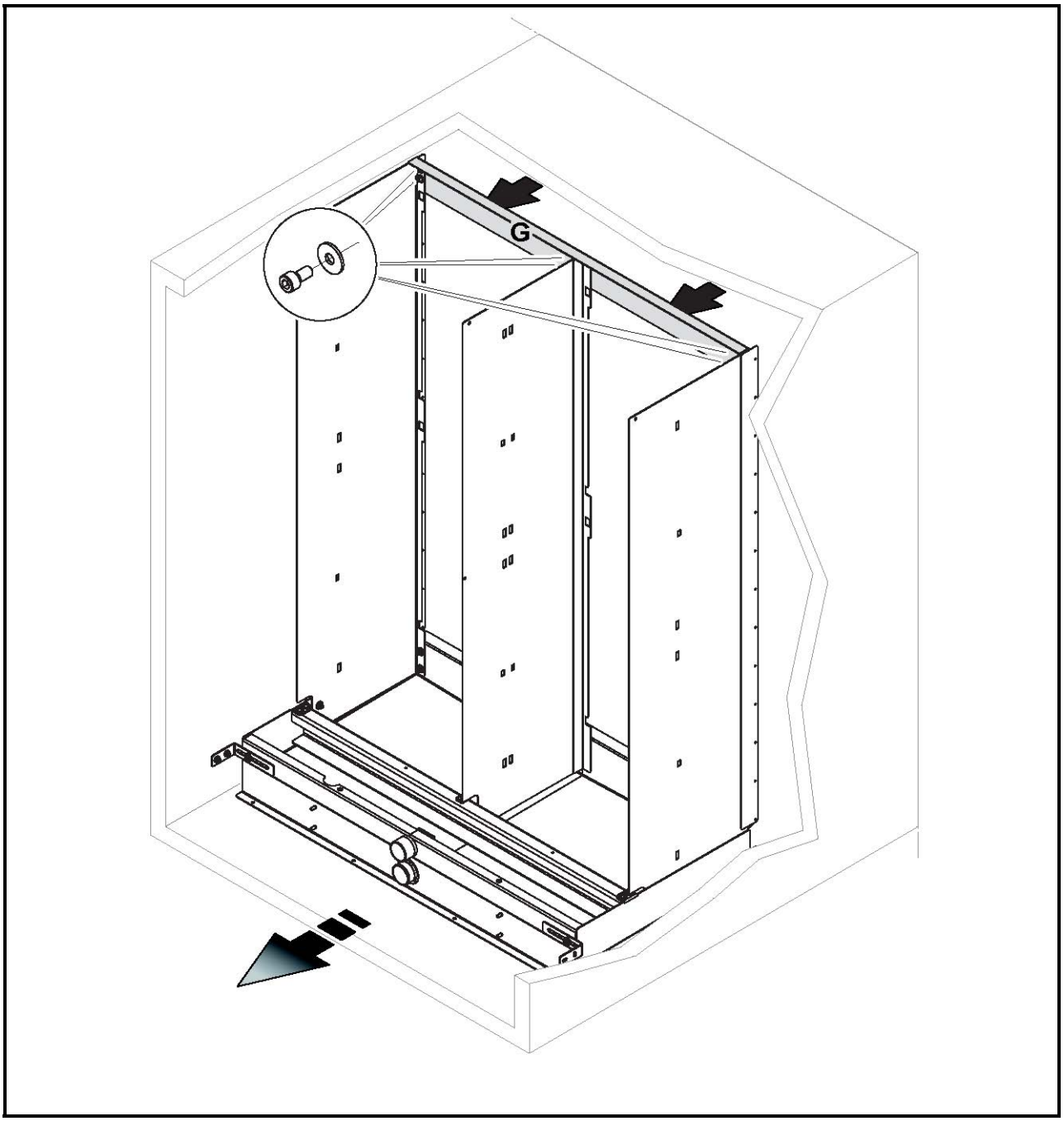


Figure 5. Mounting Process – Step 5

Fix the front bracket "**G**" to each vertical support using two hexagon socket screws 1/4 UNC x 1/2" and washers.

Important! Before tightening the screws make sure all supports are vertically exactly aligned!

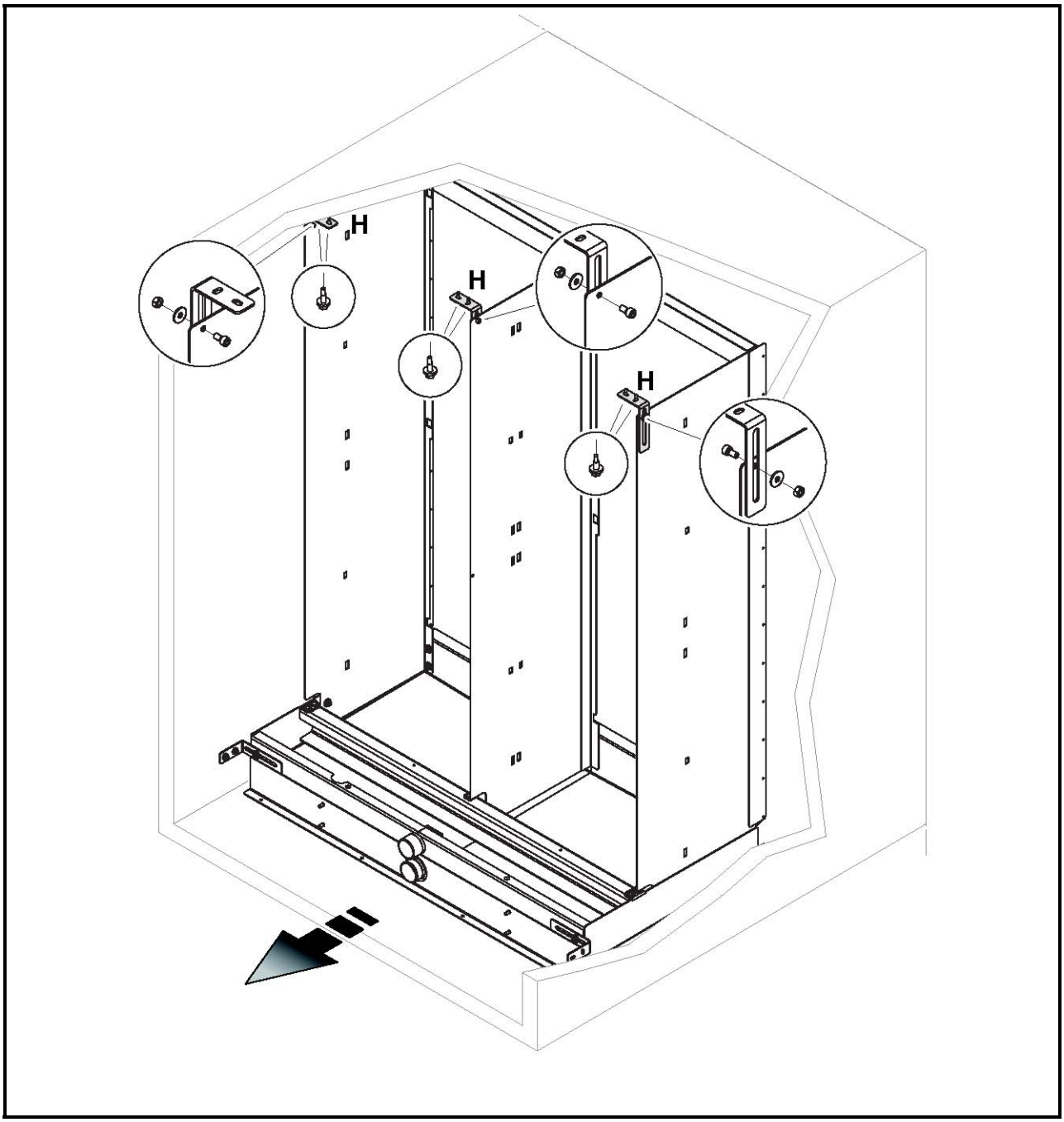


Figure 6. Mounting Process – Step 6

Fix one mounting bracket "**H**" to each vertical support and intermediate support using a hexagon socket screw 1/4 UNC x 1/2", a 1/4 UNC nut and a washer (see figure above). **Important**: With multiple intermediate supports all mounting brackets must be mounted to the supports on the same side. The mounting brackets fixed to the outermost supports must be mounted always outside (between duct wall and support) and point inward.

Finally align the supports, then fix the mounting brackets to the duct ceiling using two self-tapping screws 1/4 UNC x 3/4" each.

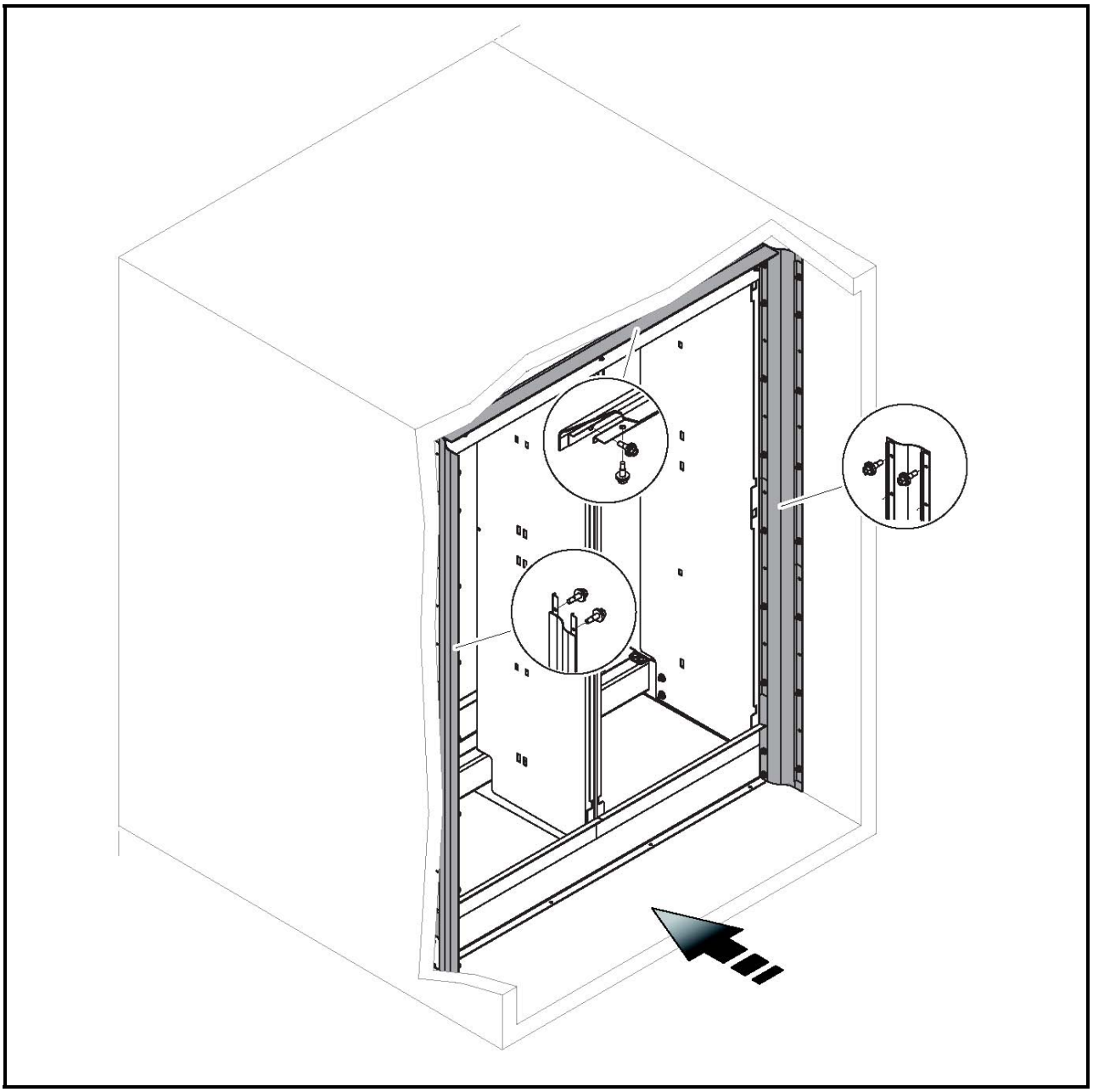


Figure 7. Mounting Process – Step 7

The air gap between the outermost vertical supports and the duct walls as well as between the front bracket and the duct ceiling must be sealed using EPDM sealing profile (accessory). Cut the EPDM sealing profiles to the desired length (channel height and channel width plus cm allowance). Fix the EPDM sealing profiles to the outermost vertical supports and to the front bracket using the clamping brackets and self-tapping screws #10 x 3/4" supplied. Tailor the EPDM sealing profiles to the duct height and the duct width, then fix them to the duct walls and the duct ceiling using the clamping brackets and self-tapping screws #10 x 3/4" supplied (number of self-tapping screws to be used as required).

Note: In place of the EPDM sealing profiles also sheet metal angles of stainless steel (not included in the delivery) may be used for the sealing.

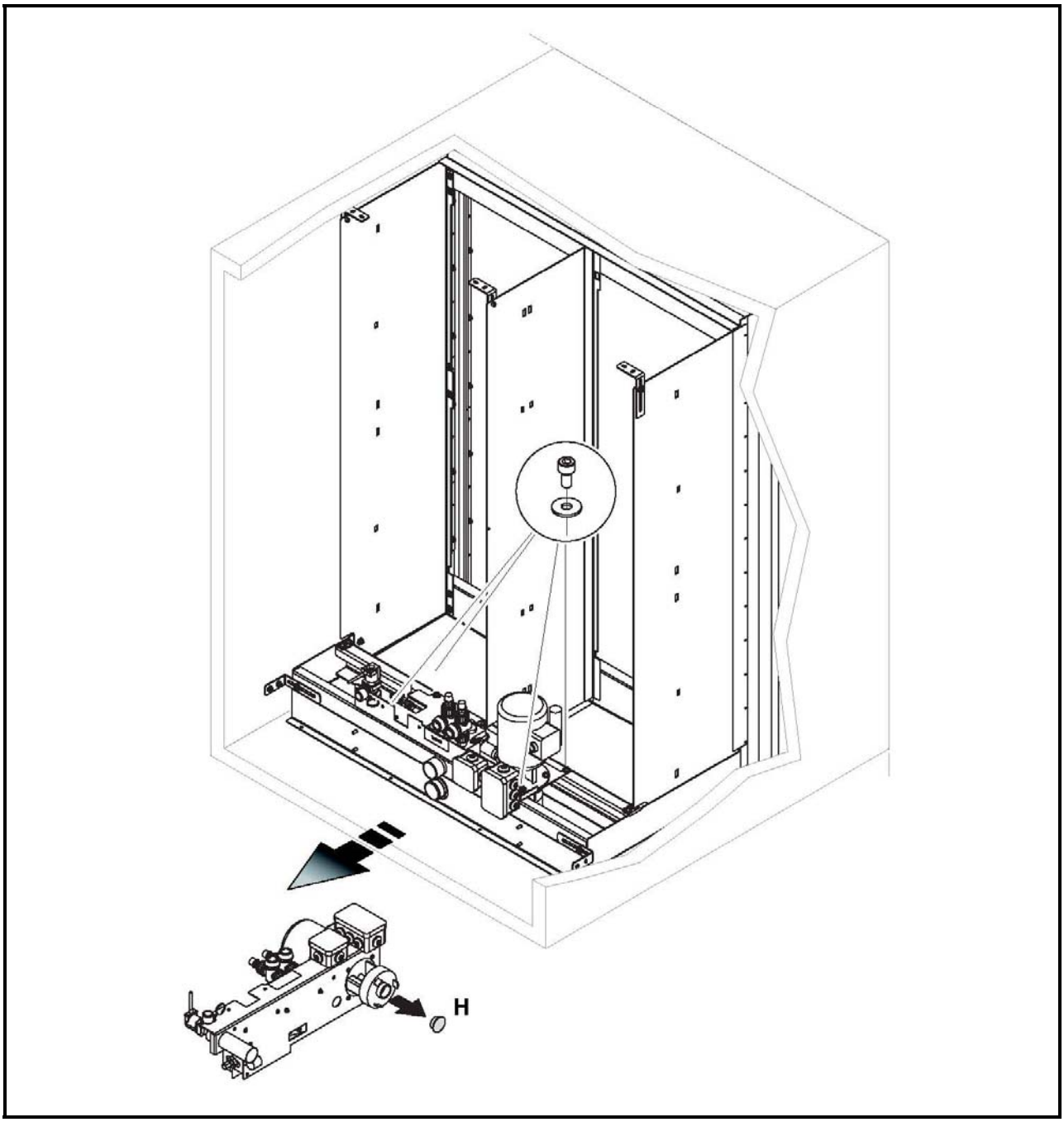


Figure 8. Mounting Process – Step 8

Fix hydraulic unit to the water tub and the cross beam using four hexagon socket screws 1/4 UNC x 1/2" and washers.

Important: **Remove the closing plug "H" from the circulation pump inlet** before mounting the hydraulic units MHB Reflow or MHTC Reflow.

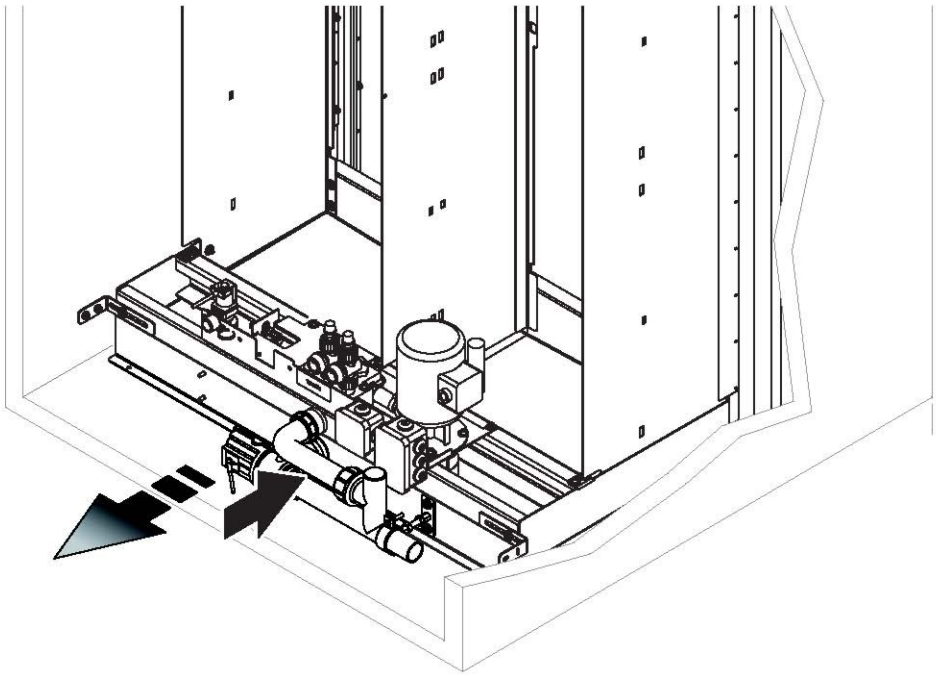


Figure 9. Mounting Process – Step 9

Assemble the drains according to the corresponding figure above (the drains can be assembled for draining to the right or to the left) and fix it to the water tank using the mounting bracket provided.

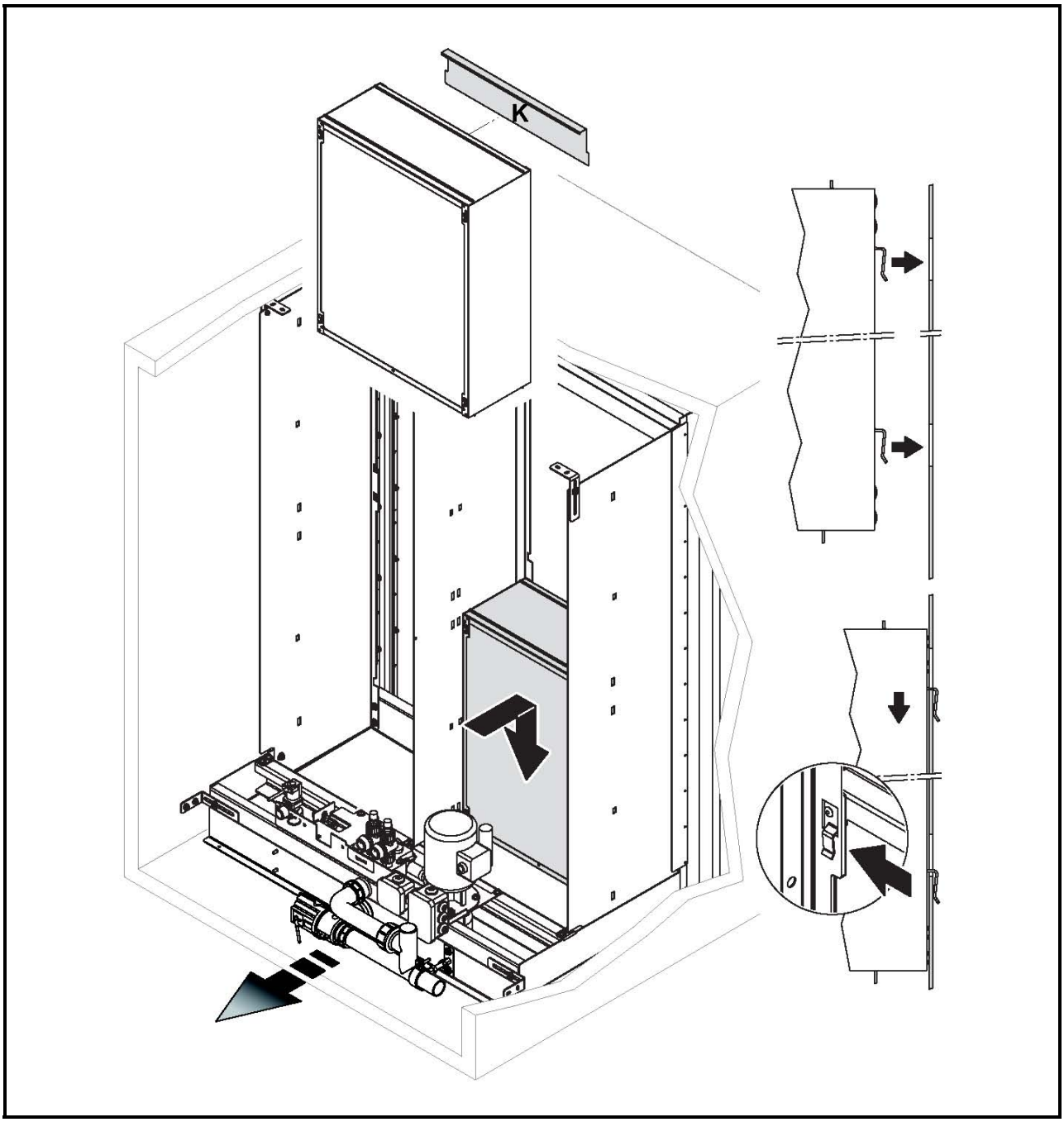


Figure 10. Mounting Process – Step 10

Starting from the bottom, install the humidification boxes in each row: Hook the mounting clips of the boxes into the corresponding openings of the supports, then push the humidification box downwards until it comes to a stop (arrangement of the humidification boxes according to the installation drawing included in the delivery).

NOTE: In systems with an air speed >925 fpm (4.7 m/s) through the boxes the cover sheet “K” must be mounted to all topmost humidification boxes before installing them.

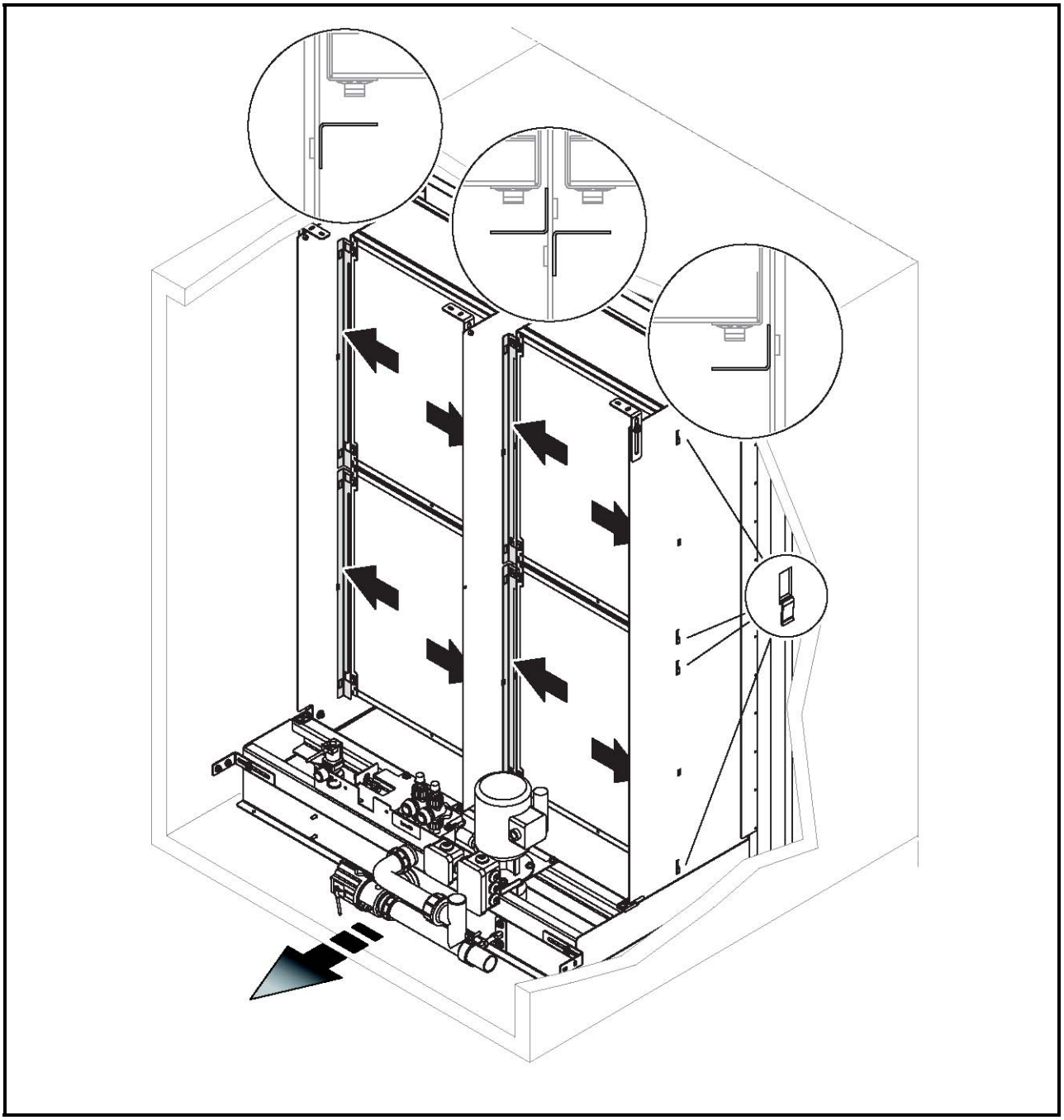


Figure 11. Mounting Process – Step 11

Only for units with mist eliminator: Hook the mounting brackets into corresponding openings of the vertical supports, then push the brackets downwards until it comes to a stop (if necessary use a rubber mallet).

Note: arrangement of the mounting brackets according to the detail figures above and the installation drawing included in the delivery.

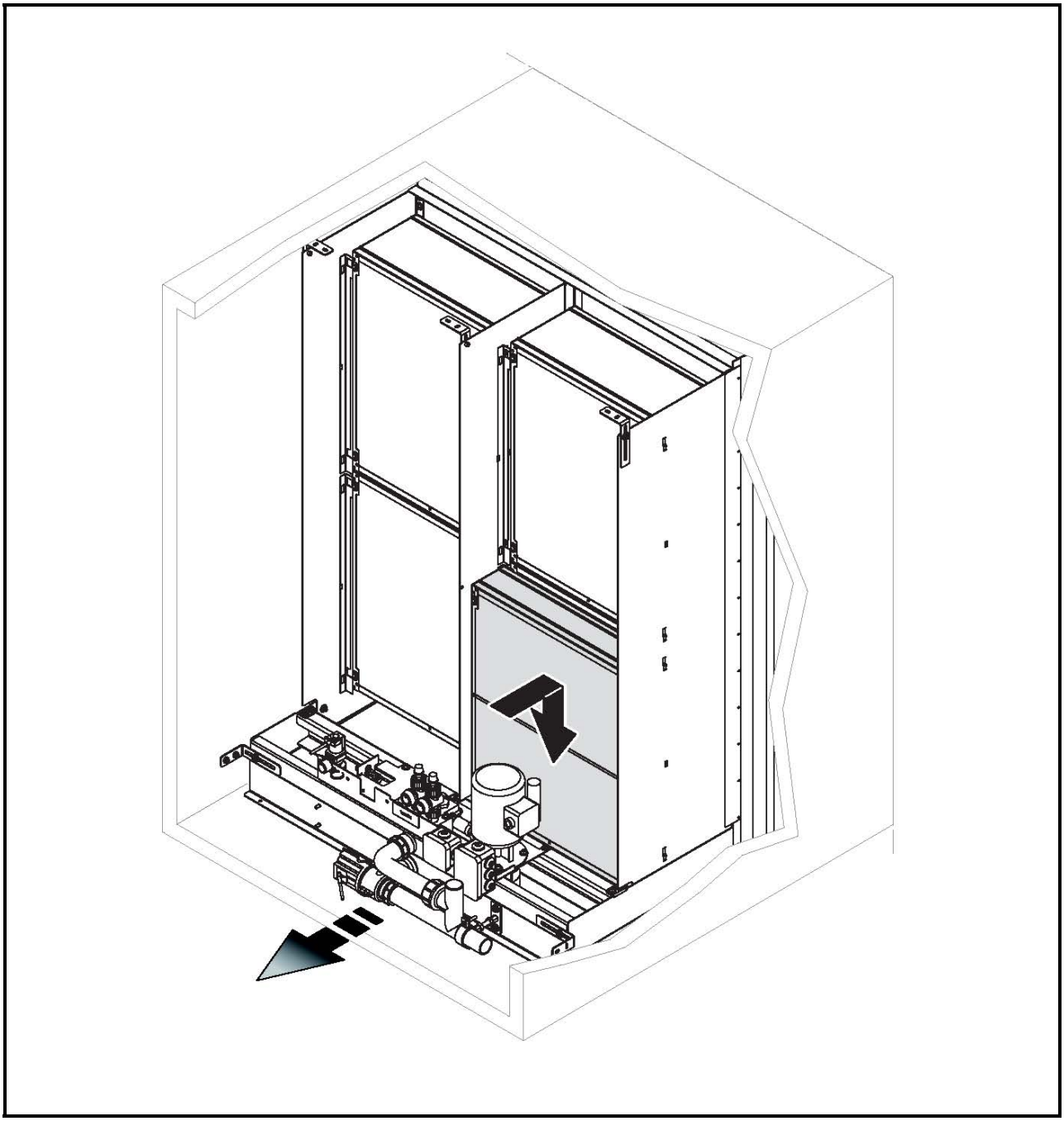


Figure 12. Mounting Process – Step 12

Only for units with mist eliminator: Starting from the bottom, install the mist eliminator in each row: Hook the mounting clips of the mist eliminator into the corresponding openings of the mounting brackets, then push the mist eliminator downwards until it comes to a stop.
Note: arrangement of the mist eliminator according to the installation drawing included in the delivery.

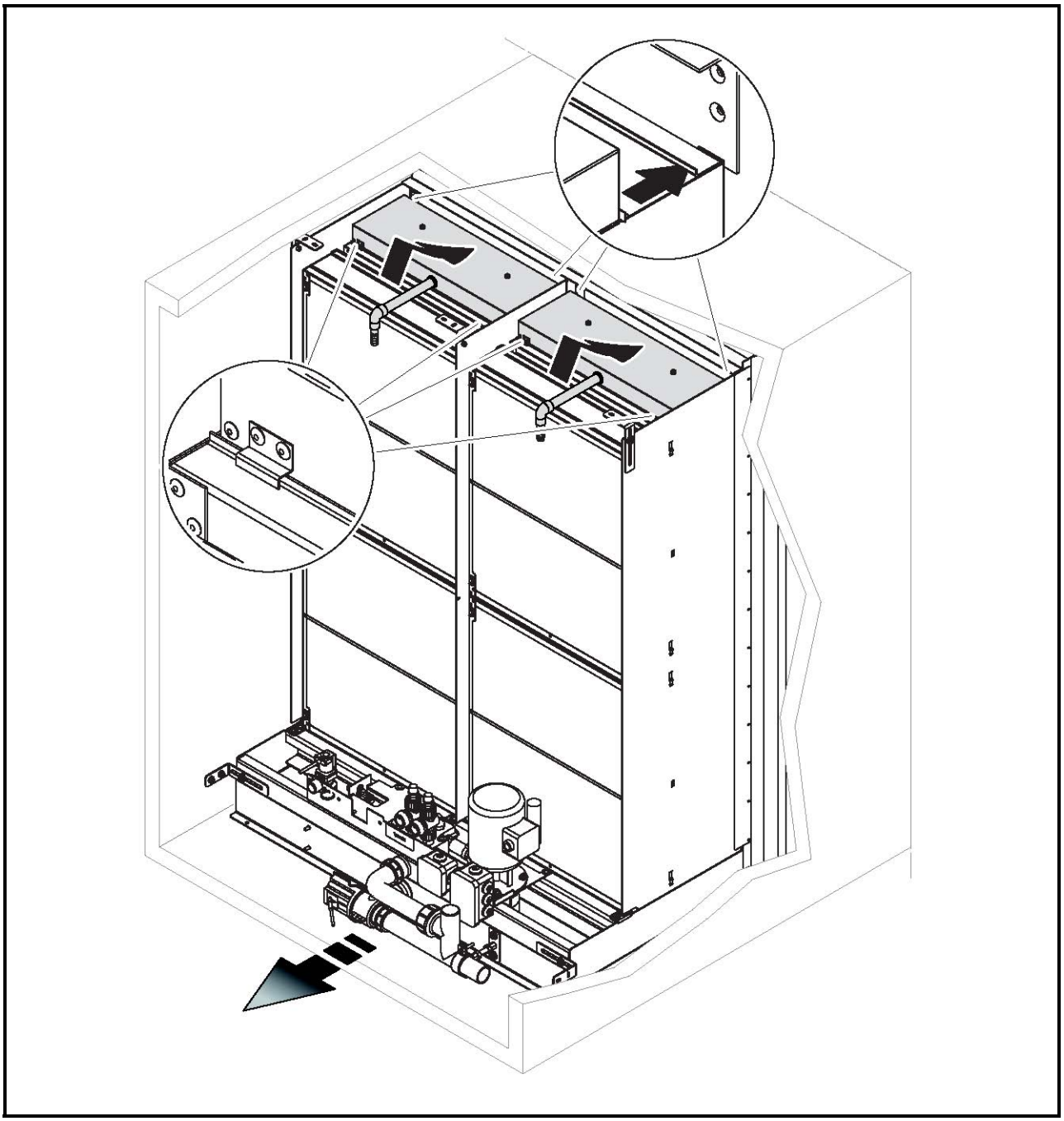


Figure 13. Mounting Process – Step 13

Mounting the spray cap bars: Push the two tongues on the back side of the trickling hood underneath the frame sheet of the humidification box (see detail above), then pivot the spray cap bars downwards. The two brackets on the front side of the spray cap bar must engage in the frame (see detail above) of the humidification box.

Note: arrangement of the spray cap bars according to the installation drawing included in the delivery.

10-20
PLUMBING & ELECTRICAL INSTALLATION

1.0 WATER INSTALLATION

1.1 OVERVIEW WATER INSTALLATION

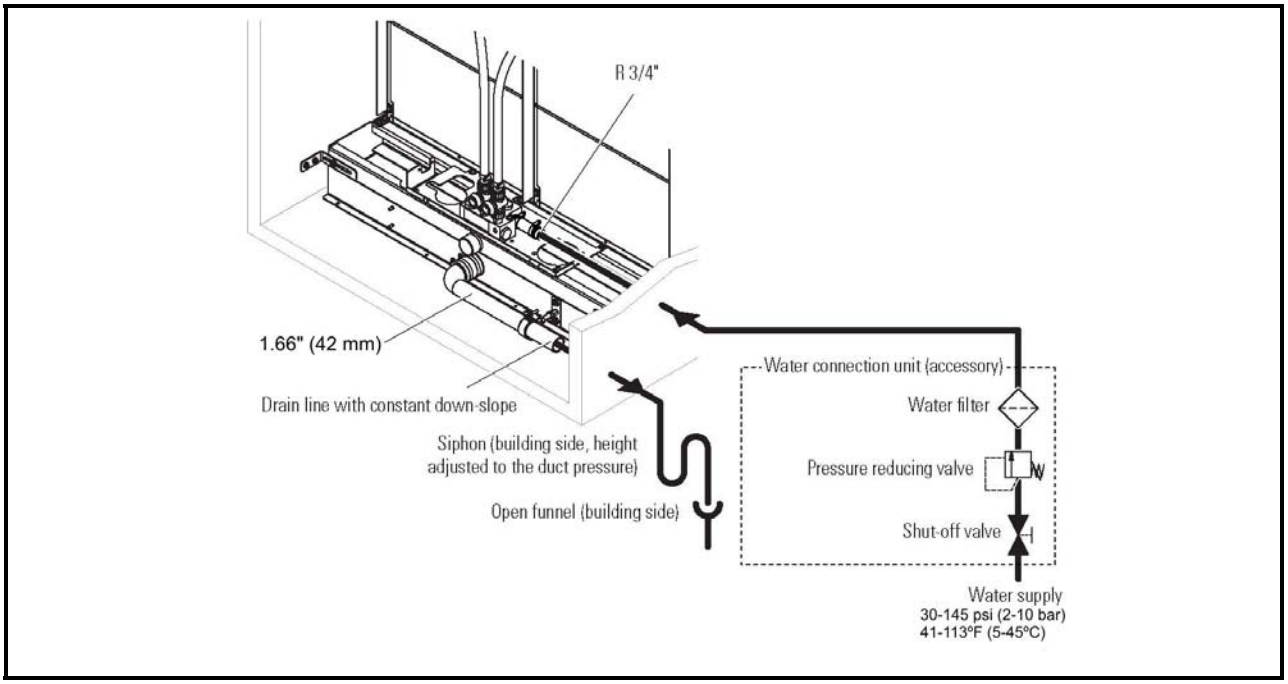


Figure 1. MHB Flow – Water Installation

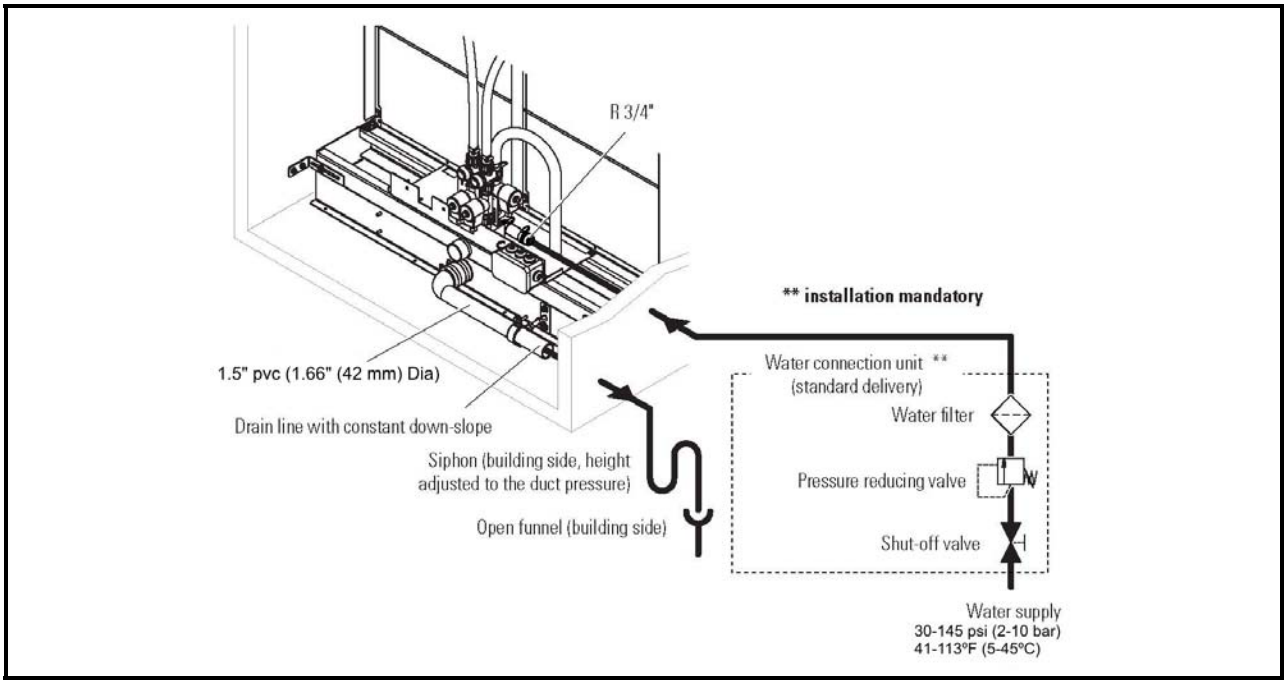


Figure 2. MHTC Flow – Water Installation

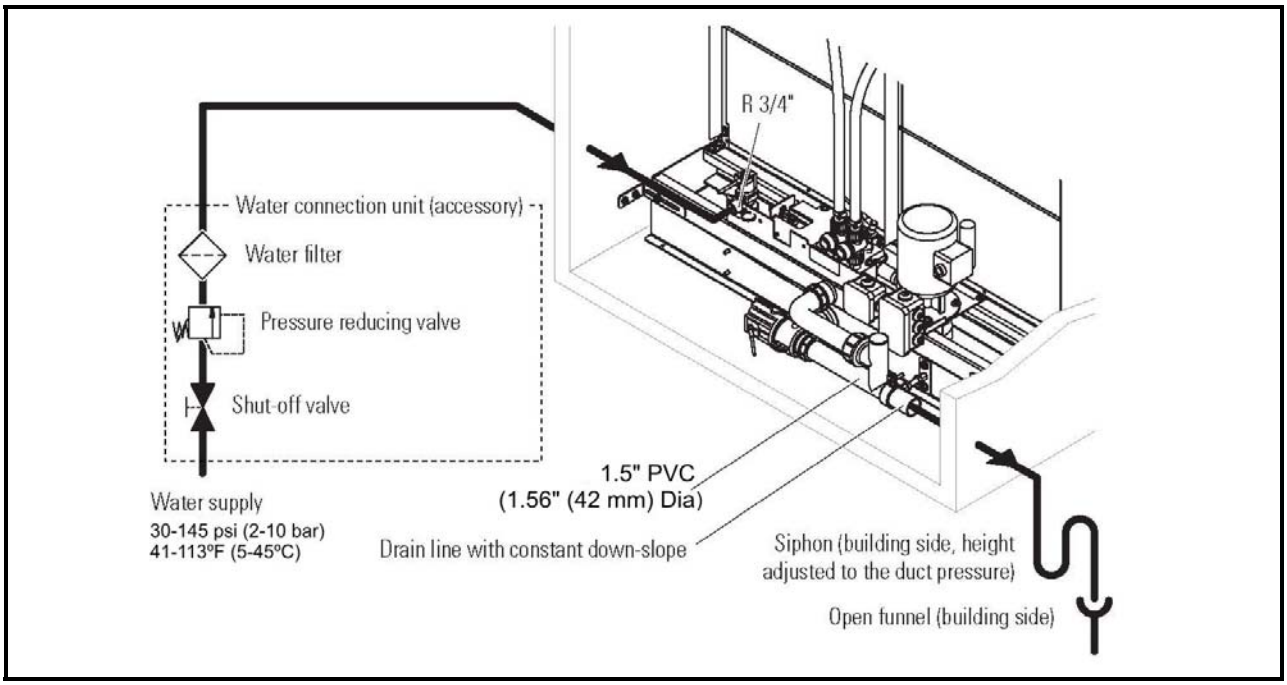


Figure 3. MHB & MHTC Reflow – Water Installation

1.2 NOTES ON WATER INSTALLATION

Water supply

The water supply is to be carried out according to the figure found in this chapter and the applicable local regulations for water installations. The indicated connection specifications must be observed.

- The installation of the shut-off valve, pressure reducing valve and a water filter should be made as close as possible to the unit.

Notes on water quality:

- For the water supply of the Nortec MH, use exclusively untreated drinking water, Reverse Osmosis Water, fully demineralised water or partly softened water.
- The use of additives such as corrosion inhibitors, disinfectants, etc., is not allowed, since these additives may endanger health and affect proper operation.
- If the Nortec MH shall be operated with softened water, please contact your Nortec supplier.
- The connection material must be pressure-proof and certified for use in drinking water supply systems.
- Important: Before connecting the water line to the unit, the line must be flushed thoroughly.

	The thread at the humidifier connection is made of plastic. To avoid overtightening, the union nut of the water pipe must be tightened by hand only.

Water drain

The water drain is to be carried out according to the figure found in this chapter and the applicable local regulations for water installations. The indicated connection specifications must be observed.

- Make sure the drain line is installed with a constant down-slope to the siphon of the building.
- Make sure the drain pipe is correctly fixed and easily accessible for inspections and cleaning purposes.
- The minimum inside diameter of the drain pipe of 1.5" (38.1 mm) must be maintained throughout the entire length!

When operating the Nortec MH with fully demineralised water fully demineralised water is aggressive! For this reason, use exclusively plastic or stainless steel installation materials.

1.3 ELECTRICAL INSTALLATION

1.3.1 Leading the electrical cables out of the duct

Note: The electric installation of the unit models for the Nortec MH “Flow” and “Reflow” is the clients responsibility.

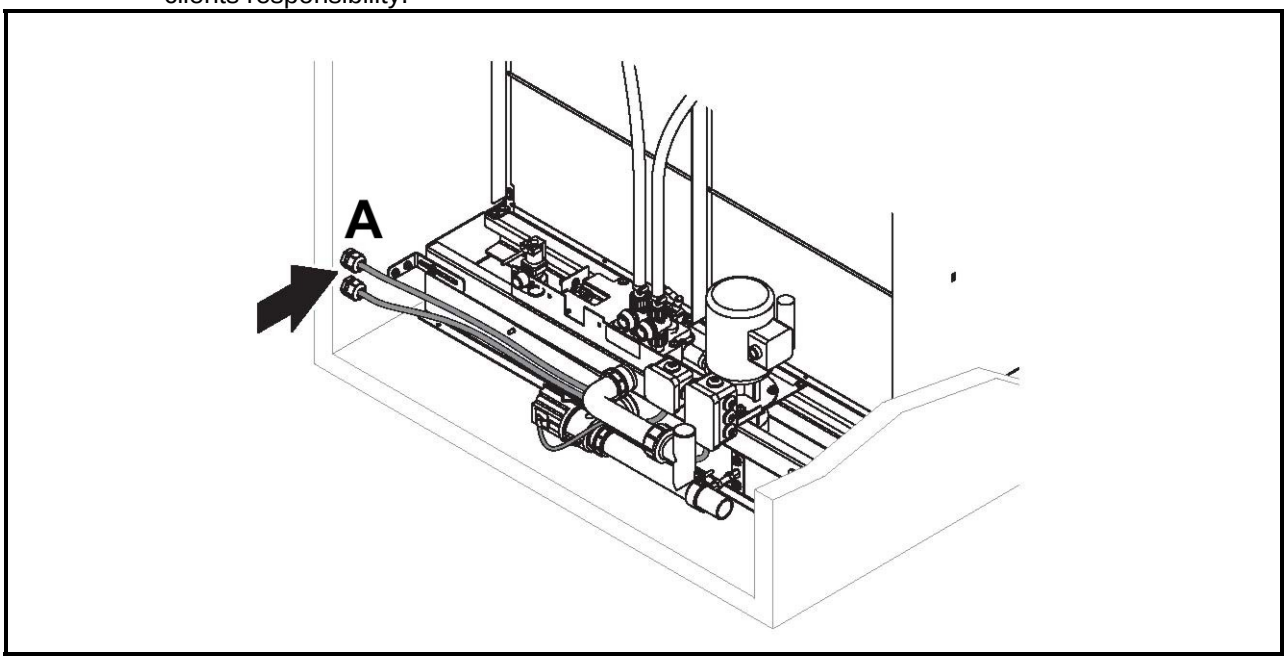


Figure 4. Leading the electrical cables out of the duct

- Lead the low voltage multi conductor control cable via liquid tight conduit fittings, “A” out of the duct.
- MH Reflow models – Install a power cable rated for plenum use and meeting all local electrical codes (not provided) to the wires in the pump motor’s junction box “B”. Route the power cable out of the duct via liquid tight conduit fitting.

1.3.2 Mounting the MH Control Unit

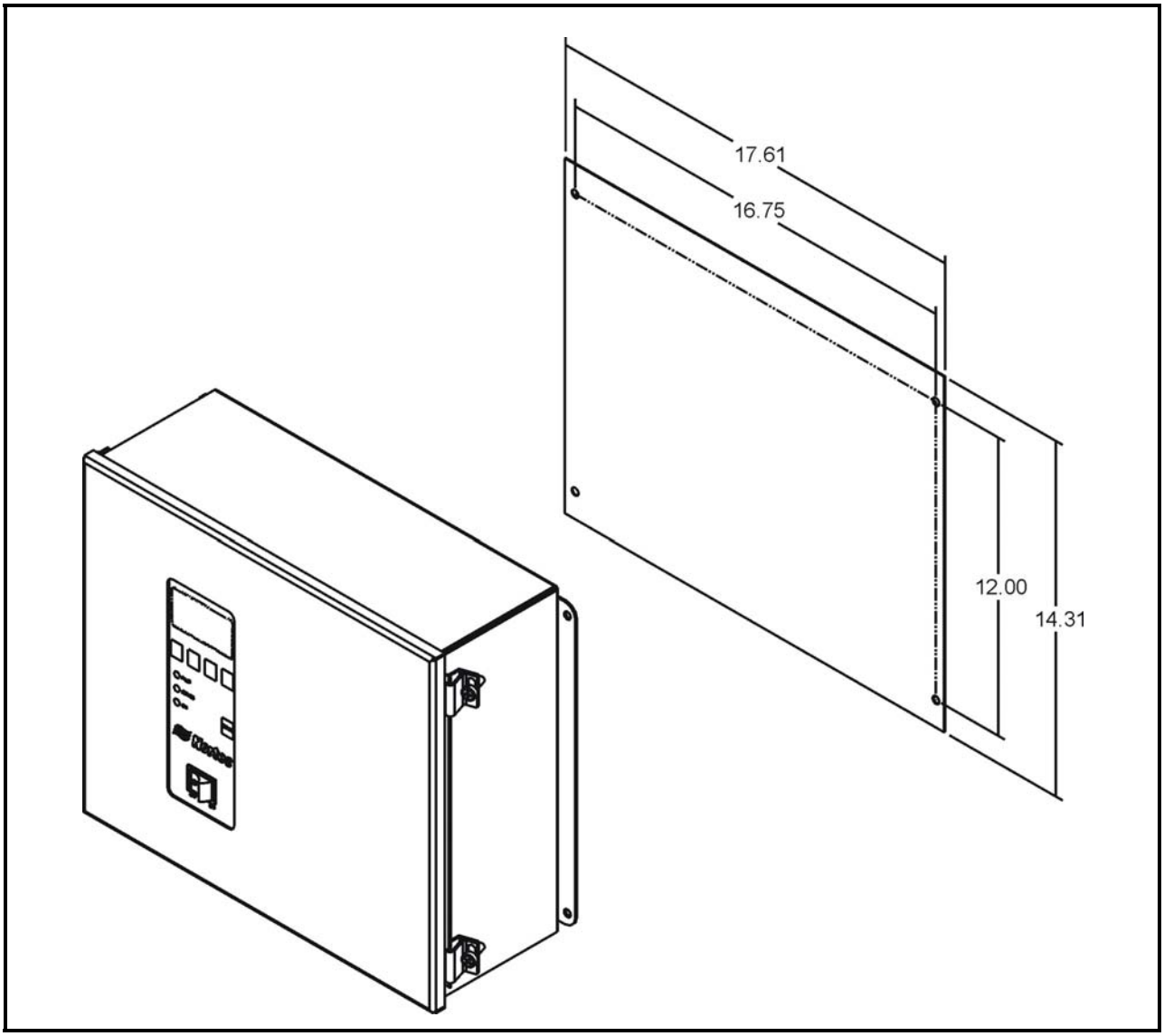


Figure 5. Mounting the MH Control Unit

1. Fix the control panel to the wall using 4 x ¼" screws (not provided).
2. Connect the multi conductor control cables from the hydraulic unit to the corresponding terminals in the control unit according the appropriate wiring diagram.
   Important: all cables must be lead into the control unit via strain reliefs installed into the openings in the bottom of the control panel housing.
3. MH Reflow models – Connect the power cable from the pump motor to the corresponding terminals according to the appropriate wiring diagram.

1.3.3 Wiring Diagram Nortec MH Flow

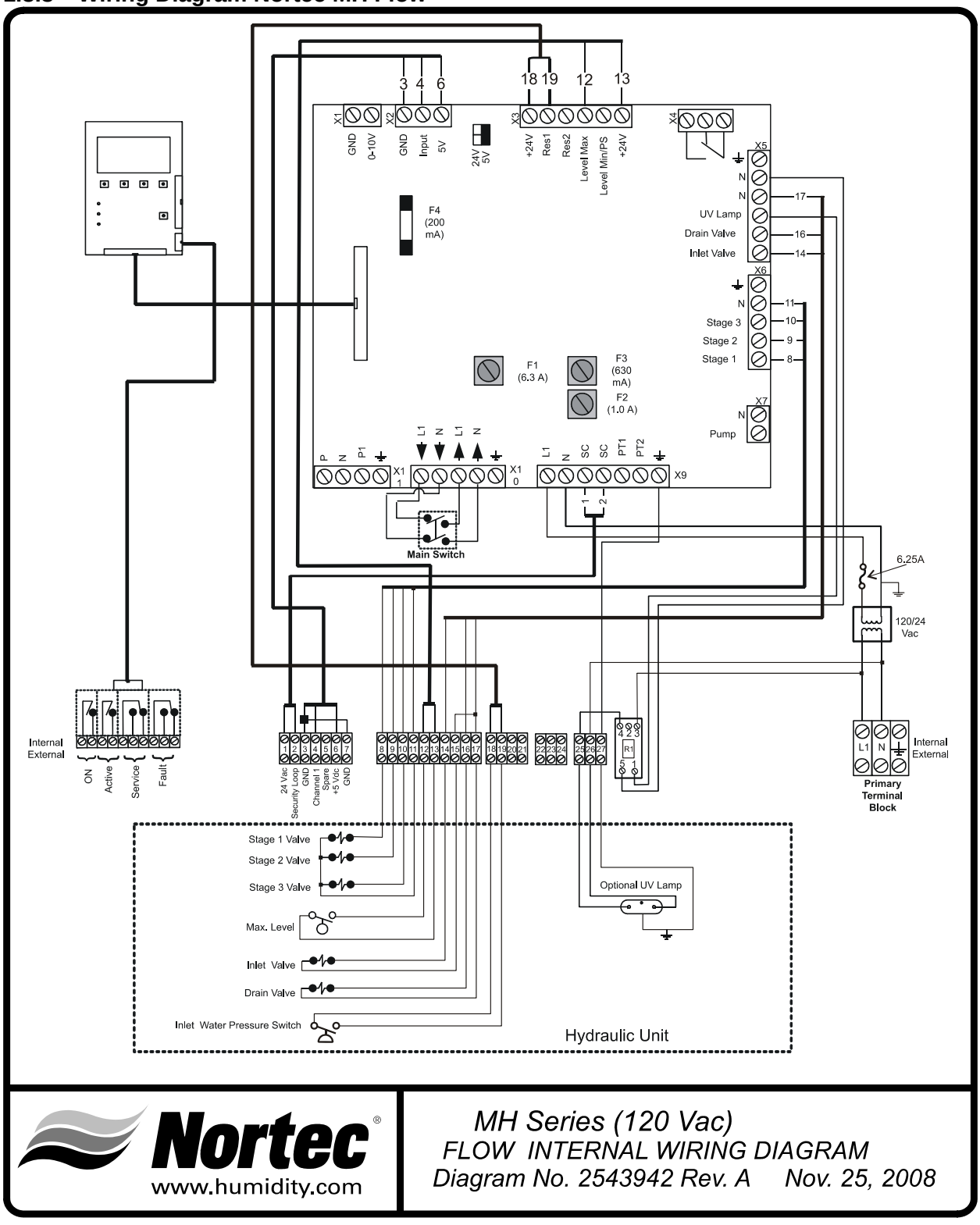


Figure 7. Wiring Diagram MH Flow

1.3.4 Wiring Diagram Nortec MH Reflow

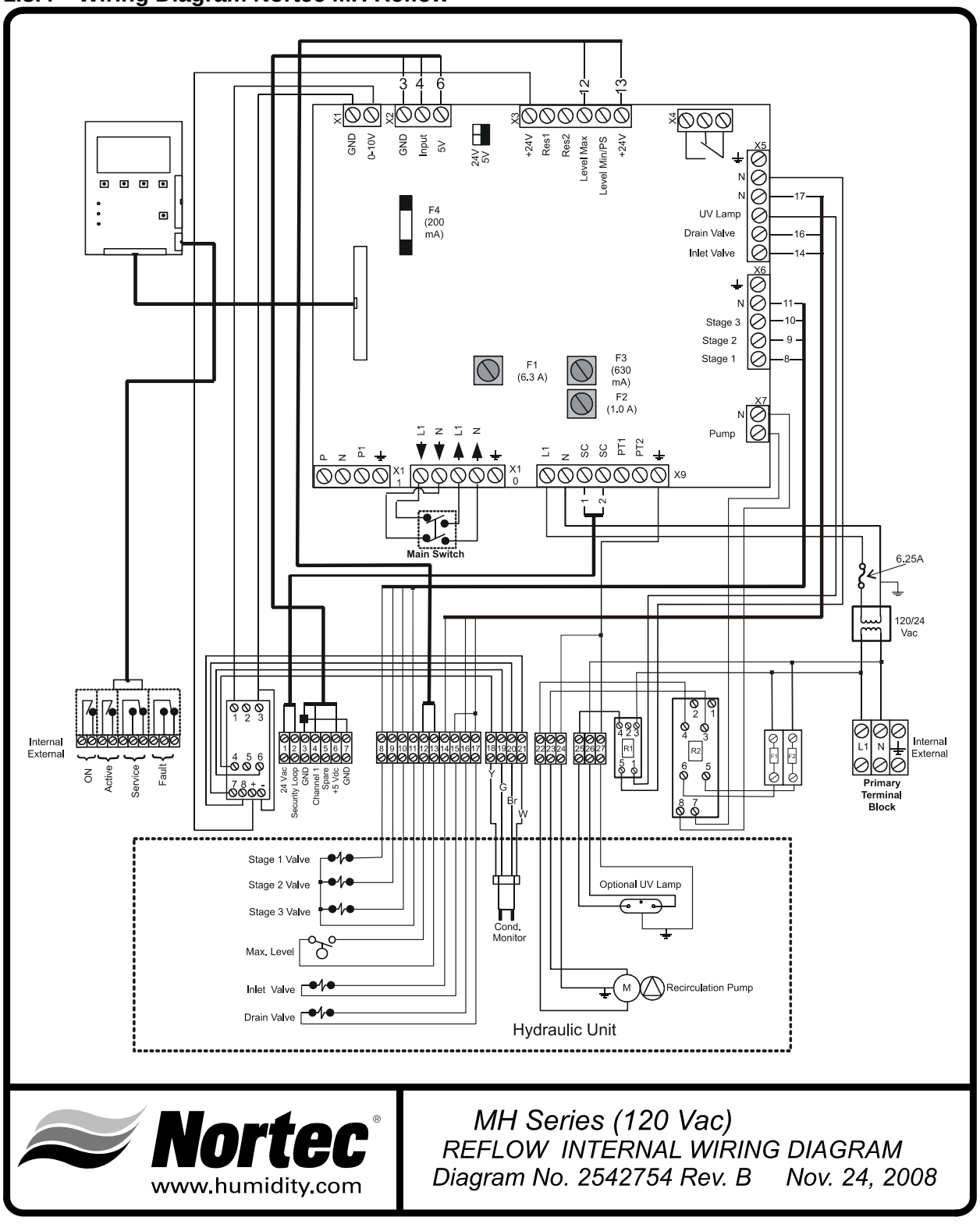


Figure 8. Wiring Diagram MH Reflow

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10-30
OPERATION

1.0 OPERATION

1.1 PUTTING INTO OPERATION

Proceed as follows when putting the Nortec MH into operation:

- Examine the Nortec MH and installation for possible damage.

	Damaged devices or devices with damaged installation may present danger to human life or cause severe damage to material assets. Damaged units and/or units with damaged or faulty installation must not be operated.

- Models MHB Flow, MHTC Flow, MHB Reflow, MHTC Reflow: Make sure the connecting box(es) and the control unit are closed and that all cables are lead through cable glands.
- Open the shut-off valve in the water supply line.
- Switch on the service switch in the mains supply.
- Models MHTC Flow, MHB Reflow, MHTC Reflow: switch on the MH control unit (the unit switch lights up).
- Note: regarding the operation of the MH control unit please observe the information given in the separate operating instructions to the MH control unit.
- Check the settings of the humidistat/thermostat or the humidity controller, respectively. If necessary, adjust settings.

1.2 ADJUST THE VOLUME CONTROLLING VALVES

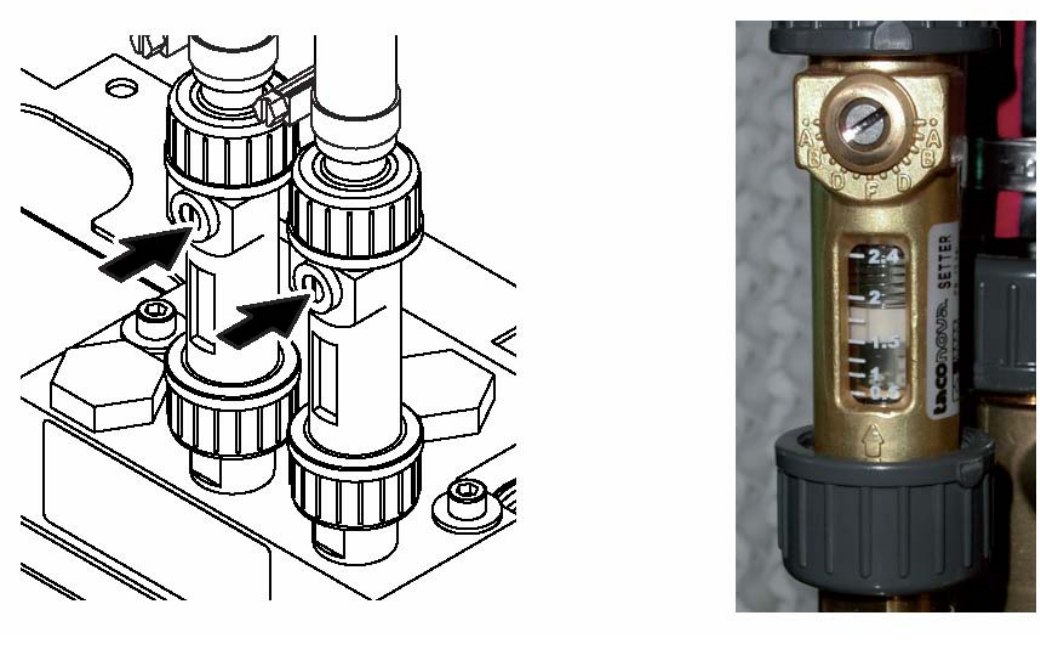

Figure 1. Adjusting the Volume Control Valves

After first time commissioning of the Nortec MH, the volume controlling valves must be adjusted to the local operating conditions according to the separate instructions.

1.3 NOTES ON OPERATION

During operation of the Nortec MH the humidification system has to be inspected weekly. On this occasion check the following:

- the water for any leakage.
- the humidifier and the other system components for correct fixing and any damage.
- the electric installation for any damage.
- unit models with MH control unit: Check operating information in display level and whether or not a warning or error message is present.

If the inspection reveals any irregularities (e.g. leakage, error indication) or any damaged components take the Nortec MH out of operation as described in chapter. Then, have the malfunction be eliminated or the damaged component be replaced by a well trained specialist or a service technician from your Nortec supplier.

1.4 TAKING OUT OF OPERATION

In order to take the Nortec MH out of operation (e.g. to perform maintenance works, to eliminate a malfunction, etc.) perform the following steps:

Close the shut-off valve in the water supply line.

Models MHB Reflow and MHTC Reflow: empty the water tub.

Models MHB Reflow and MHTC Reflow: Start manual draining (see operating instructions of the MH control unit) and wait until the water tub is empty.

Models MHTC Flow, MHB Reflow, and MHTC Reflow: switch off control unit.Important: If the unit has to be switched off because of a malfunction, please note the code of the actual error message.

Isolate all components of the Nortec MH from the mains and secure system against accidentally being reconnected to the mains.

If work has to be carried out on the Nortec MH, switch off the ventilation system and secure the system against accidentally being switched on.

Note: if the Nortec MH is not be used for a longer period of time the MHB Flow model should be taken out of operation as described above. However, the MHTC Flow, MHB Reflow, and MHTC Reflow should stay operable to keep the hygiene functions active.

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10-40
MAINTENANCE & TROUBLESHOOTING

1.0 MAINTENANCE

1.1 IMPORTANT NOTES ON MAINTENANCE

Qualification of personnel

All maintenance work must be carried out only by well qualified and trained personnel authorized by the owner. It is the owner's responsibility to verify proper qualification of the personnel.

General note

The instructions and details for maintenance work must be followed and upheld. Only the maintenance work described in this documentation may be carried out. Only use original Nortec spare parts to replace faulty parts.

Safety

Before carrying out any maintenance work take the Nortec MH out of operation as described in this manual and secure the unit against inadvertent power-up. In addition, take the ventilation system out of operation as described in the operation instructions of the ventilation system and secure the ventilation system against inadvertent power-up.

The Nortec MH must be maintained in the prescribed intervals, the cleaning work must be carried out correctly and the humidification boxes and the mist eliminator boxes must be replaced after their prescribed lifetime has elapsed.

	WARNING! If the unit is insufficiently maintained germs which can cause illness, may grow in the water tub and the humidification boxes (and the mist eliminator) of the Nortec MH and may affect the air passing through the humidifier.

1.2 MAINTENANCE INTERVALS

In order to maintain operational safety the Nortec MH must be maintained in regular intervals. The time interval for the maintenance is to be adapted to the operating conditions. The hygiene status depends mainly on the quality of the humidifier water but also on the adherence to the exchange intervals of the upstream air filter, the air velocity and the micro-biological and chemical composition of the supply air. Therefore the maintenance intervals must be determined for each system separately.

The first maintenance must be carried out after 800 operating hours. Depending on the encountered hygiene status during the first maintenance the interval time must be decreased or increased.

In any case the Nortec MH is to be maintained at least twice annually.

On units equipped with a MH control unit (MHTC Flow, and MHTC Reflow) the maintenance interval can be programmed. As soon as the maintenance time has elapsed, a maintenance message is displayed to draw your attention to the pending maintenance. To determine the maintenance interval time, the above described procedure can be used.

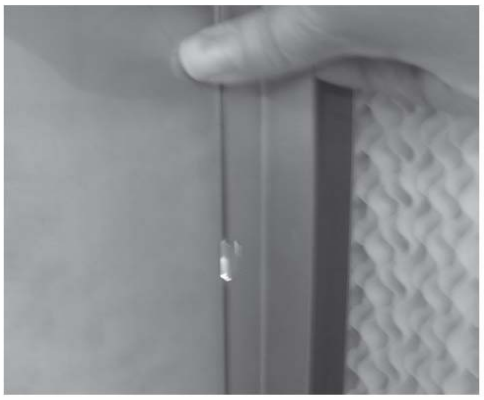
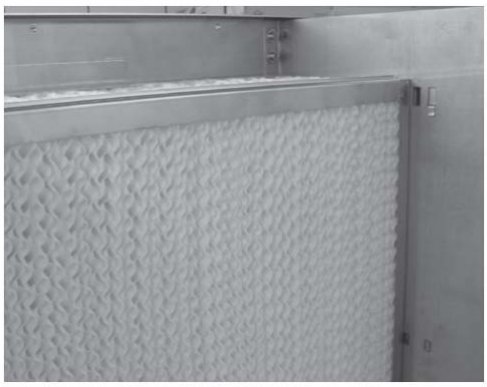
1.3 MAINTENANCE WORK

Component	Work to be carried out
Humidification boxes and mist eliminator boxes.	Dismantle and check the humidification boxes (and mist eliminator boxes). Clean the frame of the boxes with a combined detergent and disinfectant. If the humidifier fleece is heavily soiled, the humidification boxes have to be replaced. Note: If the humidification boxes indicate strong dust deposit, the air filter of the ventilation system is to be controlled (filter quality at least MERV 11 according to ASHRAE 52.2 Standard).
Water tank	Check water tank for soiling (dust, slime, mineral deposit, etc.) and clean with a combined detergent and disinfectant. Note: The actual hygiene status indicates, whether the maintenance interval time must be decreased or increased.
Frame structure	Check screw connections of the frame structure, tight loose screw connections. Clean frame structure with a combined detergent and disinfectant.
Duct section downstream of the humidifier	Check the duct section behind the humidifier (downstream) for collection of residual water. If residual water is present: Check air velocity above the humidification boxes (without mist eliminator max. 690 Fpm (3.5 m/s), with mist eliminator max. 885 Fpm (4.5 m/s), respectively). Mount mist eliminator if necessary. Clean duct with a combined detergent and disinfectant.
Hydraulic unit	Check connections and components for sealing and correct fastening. Seal/replace leaky components, replace defective components, and fasten loose components. Carefully clean the components of the hydraulic unit with a combined detergent and

	disinfectant.
Water installation	Check water the water hoses of the humidifier for cracks and correct fastening, replace defective hoses. Carefully clean the hoses with a combined detergent and disinfectant. Check water supply line for sealing and seal if necessary. Dismantle water filter (if present) and clean it.
Spray Bar Cap	Dismantle the spray bar cap and check the holes in the water distribution pipes for mineral deposit. If necessary, dismantle the water distribution pipes and remove the mineral deposit. Clean spray bar cap and water distribution pipes with a combined detergent and disinfectant.
Drain line with Siphon	Check and clean with a combined detergent and disinfectant, if necessary.
UV water treatment (Option)	Dismantle the UV lamp. Carefully clean glass tube and UV lamp. After max. of 8000 operating hours the UV lamp must be replaced.
Electric installation	Check all cables and components for correct fastening, correct function and defects. Have defective components replaced or loose components fastened by a qualified specialist.

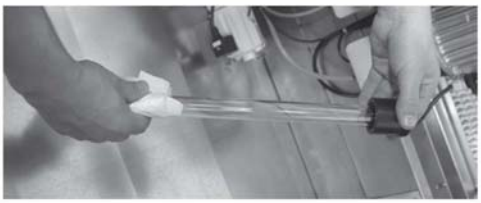
1.4 DISMANTLING AND INSTALLATION WORKS

1.4.1 Dismantle and install the mist eliminator and humidification boxes.

	1. Undo the hose clamps, then pull off the hoses from the connections on the spray bar caps. 2. Lift the spray bar caps on the water connection side and remove them to the front.
	3. Starting from the top remove the mist eliminator boxes (push box upwards and remove it to the front).
	4. Release the fixing clip in the middle of the mounting bracket by pressing slightly on the vertical support, then carefully push the mounting bracket upwards and remove it. Repeat this step for all mounting brackets.
	5. Starting from the top remove the humidification boxes (push box upwards and remove it to the front).

The installation of the cleaned or the new humidification boxes/mist eliminator boxes follows the reverse dismantling order.

1.4.2 Dismantle and install the UV lamp (option)

	1. Pull the retaining clip out to release the UV light plug. 2. Carefully lift the plug and pull the UV lamp out of the housing.
	3. Remove glass tube to the top.
	4. Clean glass tube outside and inside with a lint-free and soft cloth.

The installation of the UV lamp follows the reverse dismantling order.

	CAUTION! When installing the UV lamp, make sure to hold the lamp until it is completely inserted. Under no circumstances let the lamp fall inside the holder, since this could damage the lamp.

1.5 RESETTING THE MAINTENANCE INDICATION

When maintenance work has been completed the **maintenance indication** must be reset on the unit models flow MHTC Flow, and MHTC Reflow (yellow LED lights). For that purpose, please observe the information given in the separate operating instructions for the MH control unit.

2.0 TROUBLESHOOTING

Important! Most operational malfunctions are not caused by faulty equipment but rather by improper installation or disregarding of planning guidelines. Therefore, a complete fault diagnosis always involves a thorough examination of the entire system.

2.1 TROUBLESHOOTING LIST

PROBLEM	CAUSE	SOLUTION
Residual water in the section of the duct behind (downstream) the Nortec MH	Air velocity above the humidification boxes is too high. Units without mist eliminator max. (750 Fpm) 3.8 m/s, Units with a 4" (100 mm) mist eliminator max. 885 fpm (4 .5 m/s), with a 7.87" (200 mm) mist eliminator max. 1082 fpm (5.5 m/s).	Install mist eliminator or reduce air velocity in the duct.
	Water drain is leaking.	Check/seal water drain.
Humidity/Cooling demand present however the Nortec MH does not humidify.	Shut-off valve in the water supply line closed.	Open shut-off valve.
	Reflow Models: Circulation pump defective.	Replace circulation pump.
Maximum humidification/cooling capacity is not reached.	System incorrectly dimensioned (insufficient capacity).	Contact your Nortec supplier.
	Insufficient water supply capacity	Check water supply, increase water pressure.
	Models with MH control unit: Output limitation active.	Deactivate output limitation (see separate operating instructions for MH control unit).

Note: On units equipped with a MH control unit (MHTC Flow, MHB Reflow, and MHTC Reflow) malfunctions during operation are indicated by a corresponding event message in the display. For that purpose, please observe the information given in the separate operating instructions for the MH control unit.

2.2 NOTES ON FAULT ELIMINATION

	In order to eliminate faults, the Nortec MH must be set out of operation as described in this manual. Disconnect the unit from the mains and secure the unit against in advertent power-up.

Only allow trained and qualified personnel to repair faults. Faults relating to electrical installation must only be carried out by authorized personnel or your Nortec representative's service technician.

Repair work and replacement of faulty components must only be carried out by your Nortec representative's service technician!

3.0 TAKING OUT OF SERVICE / DISPOSAL

3.1 TAKING OUT OF SERVICE

If the Nortec MH must be replaced or if the humidification system is not needed any more, proceed as follows:

1. Take the unit out of operation as described in this manual.

2. Have the unit (and all other system components, if necessary) un-mounted by a qualified service technician.

3.2 DISPOSAL / RECYCLING

Dismantled components must be disposed of and/or recycled according to the local regulations. In case of doubt please contact your Nortec supplier.

4.0 PRODUCT SPECIFICATIONS

4.1 TECHNICAL DATA

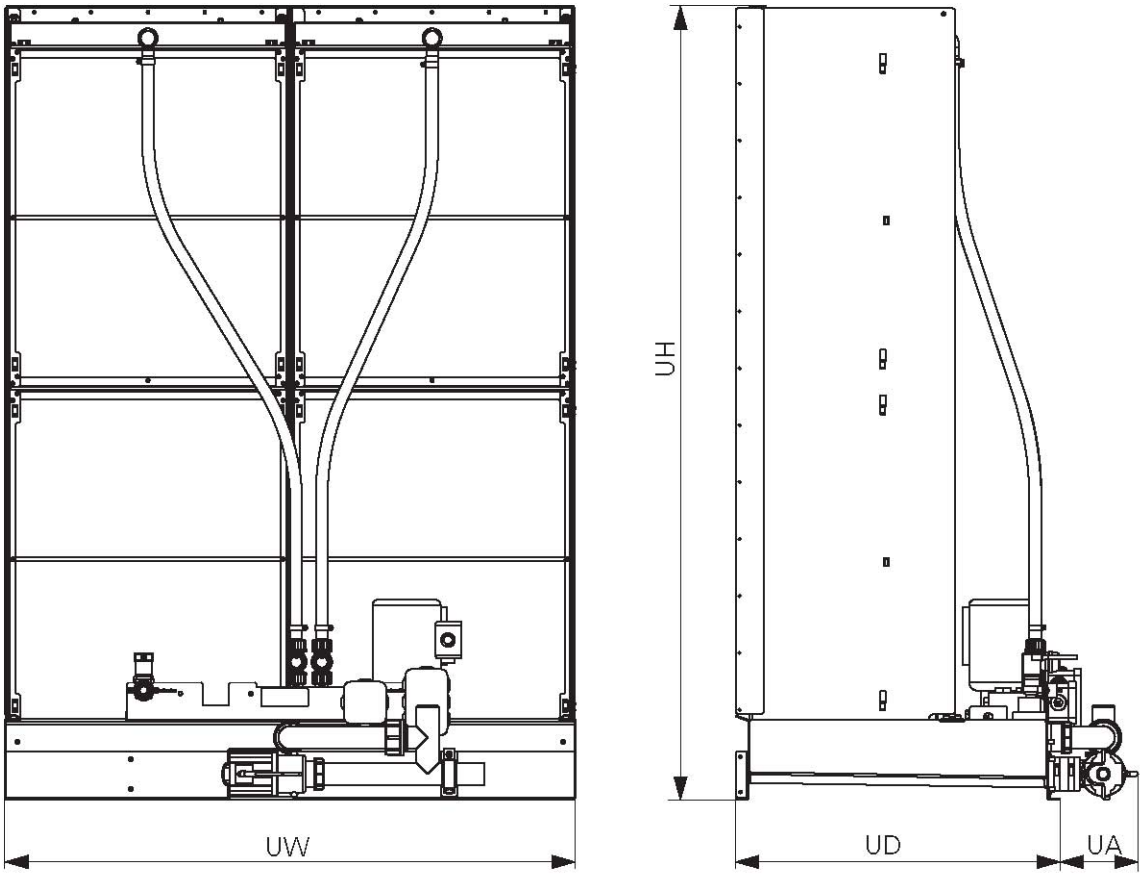
	MHB FLOW	MHTC FLOW	MHB REFLOW	MHTC REFLOW
Control	Humidistat	Total Controller	Control MHB	Total Controller
Control supply charge	120 VAC / 60 Hz	120 VAC / 60 Hz	120 VAC / 60 Hz	120 VAC / 60 Hz
Circulation pump supply voltage	---	---	120 VAC/60 Hz	
Control signals	Potential free contact of an external humidistat / thermostat	0…5 VDC 1…5 VDC 0…10 VDC 2…10 VDC 0…16 VDC 3.2…16 VDC 0..20 mA 4..20 mA	Potential free contact of an external humidistat / thermostat	0…5 VDC 1…5 VDC 0…10 VDC 2…10 VDC 0…16 VDC 3.2…16 VDC 0..20 mA 4..20 mA
Control characteristics	On/Off	Control Step	On/Off	Control Step
Control accuracy	Control accuracy depends on air conditions, control distance, water quality and probably on the number of On/Off cycles.			
Max. admissible air speed above humidification boxes	3.8 m/s / 750 fpm (4.5 m/s / 885 fpm with 4" (100 mm) mist eliminator, 5.5 m/s			
Water supply	R ¾" outside thread			
Water drain	1.5" PVC (1.66" (42 mm) OD) outside diameter of tube			
Admissible water supply pressure				
Admissible water temperature	41-113ºF (5-45ºC)			
Water quality	Tap water, Reverse Osmosis, softened or fully demineralized water.			
Pressure drop	Typically 0.44 IWC @ 500 fpm, 90% rh			
Admissible ambient temperature (Control unit)	34…104ºF (1…40ºC)	34…104ºF 1…40ºC	34…104ºF 1…40ºC	34…104ºF 1…40ºC
Admissible ambient humidity (Control unit)	Max. 75% rh	Max. 75% rh	Max. 75% rh	Max. 75% rh
Degree of protection of Control unit				
Degree of protection of pump, valves, etc.				
Fire classification of humidification medium	UL 900 Class 1			

Accessories				
Supply valve connection (24V)	S	S	S	S
Drain water connection (24 V)			S	S
Duct humidistat	•	•	•	•
Room humidistat	•	•	•	•
Duct humidity sensor		•		•
Room humidity sensor		•		•
Remote indication PCB On/Error/Maintenance/Humidification		S	S	S

Options				
UV water treatment		•		•
Drain valve (24VAC)			S	S
Conductivity monitoring			•	•
Nortec Links BMS Interface		•		•
Nortec OnLine Web Control	•	•	•	•

S = Standard Equipment
• = Option

4.2 UNIT DIMENSIONS



UH: 25.4…120.0 (645…3045) (Increments of 2.95”)

UW: 23.8…118.3 (604…3004) (Increments of 3.94”)

UD:

Max. humidification efficiency	Depth Humidification box	Depth Mist eliminator	Depth UD
85%	8” (200 mm)	----	22.5” (573 mm)
85%	8” (200 mm)	4” (100 mm)	22.5” (573 mm)
85%	8” (200 mm)		26.5 (673 mm)
95%	12” (300 mm)	----	26.5 (673 mm)
95%	12” (300 mm)	4” (100 mm)	26.5 (673 mm)
95%	12” (300 mm)		30.4” (773 mm)

UA: MHB / MHTC Flow 3.8” (97 mm)
MHB / MHTC Reflow 5.9” (131 mm)

WARRANTY

(1) WALTER MEIER INC. and/or WALTER MEIER LTD. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted (with the exception of the cylinder), are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

(2) THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

(3) The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

(4) THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

(5) THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

(6) THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

(7) THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

Nortec
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U.S.A.
Walter Meier (Climate USA) Inc.
826 Proctor Avenue
Ogdensburg, NY 13669
TEL: 1-866-NORTEC-1
EMAIL: northamerica.climate@waltermeier.com
WEBSITE: www.humidity.com

CANADA
Walter Meier (Climate Canada) Ltd.
2740 Fenton Road
Ottawa, ON K1T 3T7
TEL: 1-866-NORTEC-1
FAX: (613) 822-7964

Authorized Agent: